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EDITORIAL.

THE NEWER EDUCATION FOR CHILDREN.

Assuredly, as Ellen Key has written, this is "the century of the child"; and if any other subject has received greater attention in these latter days, the matter has escaped us. On all sides we hear that most, if not all, of our ideas in the upbringing of the child have been wrong and that the times are ripe to remedy our past neglect. That the period is with us now, to accomplish what all the reformers would desire, may be open to doubt; but what is clearly written across the thought of the day is that even a small beginning would be better than our present apathy. And apathy it is that has been in control of our attitude toward the child; not the apathy which arises from a studied indifference, but the sort that always accompanies routine thinking. But we are awaking, and if the results in the next few years justify the revolutionary course pursued by the most radical element in the educational camp, great regret will be expressed by all that the older methods of education were allowed to last as long as they did.

If the reader of these lines is at all interested in the subject, we would refer him to Dr. Boris Sidis' address, "Philistine and Genius," which was delivered before the Harvard Summer School, August, 1909, and to Mr. H. Addington Bruce's article, "New Ideas in Child Training," in the *American Magazine* for July. Both these essays are on the same lines and make plain to the reader that the child of tender years, say three, is a thinking animal, and that it is just as easy for it to learn Greek or Latin as it is for it to master its own language. At first glance, this sort of reasoning might appear ridiculous, but the tests which have been made by Dr. Sidis, Professor Leo Wiener and Rev. A. A. Berle in their own families must discountenance so superficial a view. True, none of the

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children have as yet reached their majority so as to prove beyond a doubt that this so-called over-education has not undermined their physical and mental beings. But from what is in evidence to-day—their ages vary from nine to sixteen—no deleterious effects are perceptible. Certainly the absence of any drawbacks is not at all surprising when the methods, as set forth by these pioneers in the field of education, are closely studied.

To anyone, who will take the trouble to study our present public-school system even in a cursory manner, the thought must strike him that as a system it may have its good points, but as a means for educating divers minds of manifold shadings it is a failure. Mr. Gradgrind, as pictured by Dickens, was also enamored of a system, and though when we read of him in "Hard Times" our risibles are never quiet so great is our enjoyment, we somehow forget that in this world of ours to-day it is system in all things that makes its strongest appeal to man. This can be very easily explained on the ground that a system, when once evolved by an educator, a manager of a department store or an overseer of a factory, simplifies matters greatly, for by compelling those under him to work within its limits or incur his displeasure, he relieves himself of a multiplicity of irritating matters, which, if recurring daily, would doubtless rob him of a large share of his content. But the ease which comes to him through his undeviating methods does not affect those, who must obey, in a similar manner; for though in the instances in which there are adults to be disciplined the rebellious spirit may not be too evident, in the child, on the other hand, there is no denying its presence. And then what more natural than greater efforts to subdue recalcitrance until finally, as Dr. Sidis puts it, a condition is evolved in the child that can best be characterized as "sheepish submissiveness."

Now what has the newer note in education to offer us? In the first place, the process is started at a very early age, and instead of waiting for the educator to mow down the stubbles when the child is six so that the usual lessons may be learned, the parents devote their time to training its mind so that all lessons in after-years will be easy of comprehension. And no compulsion of the public-school order is used, but a persuasiveness which only a parent, who is interested in his child's mental growth, knows how to exercise. In short, if you teach a child how to concentrate its mind on one subject and not on a half dozen, as is done in our schools to-day, the results cannot but be gratifying. And as for the studies, can it be denied that the intricacies of Greek or Latin are more difficult to grasp than those of the English language, provided the child hears only Greek or Latin during certain hours of the day? We are prone to think our own language the simplest in the world because we acquire it naturally; but the plea of simplicity is wrong, though the natural manner in which

it is acquired cannot be gainsaid. And if partial mastery of one's native language can be attained at any early age, in a manner that is natural, is this not indicative enough that the mind of the child is not the barren soil we have allowed ourselves to believe it to be, just because we were too careless to think otherwise?

This matter of the closer relation of the parent and the child should interest all physicians; for have they not seen, in the past, the bad effects which have arisen from a dissociation that was ever widening? Not only in an educational sense, as is generally understood, will the *rapprochement* bear fruit, but in that wider meaning of the word, which is inclusive of all those matters which bear on the moral and physical phases of life. And, if a better sort of manhood is effected, physicians should rejoice loudest, for at present are they not assailed daily by lay critics for not sounding a warning note in connection will all the foolish things doting parents do out of sheer love (?) for their children?

THE PHYSICIAN AND HIS HOBBIES.

A very interesting subject, indeed, is the perennial one and which might be formulated into this: Should a physician, who is keen on acquiring patients and a reputation among his confrères as an enthusiast of his work, divert his mind by indulging in one or more hobbies? While at first glance this question may strike the reader as easy of answer, since this must be in the positive, it would be well for him to use considerable forbearance before delivering his opinion. Cases have been on record, he will be told by some wiseacre, that undoubtedly show to what foolish lengths a hobby may drive an otherwise well-intentioned man, and how impossible it is, even in exceptional cases, to prevent its growing upon one until the nice balance between serious work and play is destroyed. These expressions, though lightly thought of by the person who has allowed himself to slip into the noose of a hobby, and imagines his happiness all-sufficient, are really remarks which should be carefully weighed; for they reflect the state of the society in which he lives. And since it is an incontrovertible fact that American society with all its good qualities is quite intolerant of the dilettante,—in fact, has a despicable opinion of him, it need not strike anyone as strange that the medical man of all men will find himself, directly it becomes known that he has leanings which are not medical, the target for a number of insinuating and ambiguous remarks which will be effective in injuring his reputation as a serious worker. Of course, if his desire is to tilt against public opinion, no matter what happens, the consequences, he should be told in advance,

will be bitter; for a defiant attitude cannot hope for any treatment less harsh than a complete ostracism.

As Laurence Sterne says: "They order this matter better in France"; and in substantiation of the applicability of this saying to what we have in mind two references should suffice. In the first place, there is the Paris Medical Orchestra, which is composed only of medical men and which gives concerts at intervals for charitable purposes. This organization would not call for comment if it were of the ordinary sort that is compelled to give performances behind closed doors, lest a police interference might be instituted by the musical critics; but the fact of its appearance in one of the largest halls and in the presence of a critical public that would not refrain from jeering, were discord evident in the slightest degree, speaks loudly for its excellence. And, secondly, the Salon des Médicins should give us even greater pause, since here is a better outlet for talent that may have been under cover for years on account of the lack of opportunity to develop it. This Salon exhibits only the works of physicians, and when we mention that at the last annual exhibit there were paintings and sculptures by such men as Labbé, Colin, Landolt, Sabouraud, Borrel, and others of equal prominence in the world of medicine, it is to indicate that this departure from their customary professional habits seems to fit in quite gracefully with their serious undertakings.

We have cited these two incidents of an agreeable nature in the life of the French physician to illustrate our point that a hobby can be prosecuted to its fullest extent without a blighting effect on one's vocation. And since the possibility of harm to the serious side of life can no longer be considered, would it not be feasible to introduce similar ideas into the life of the American physician? By "similar" we do not mean an apish imitation; rather do we mean the nurturing of any talent, no matter how small, until it blossoms forth into something that is above the ordinary.

In advocating diversions of the nature indicated above, we are prompted thereto by our observations of the average American physician's life. Though he may assert with heat that his is the completest, that all his moments are occupied, that diversions other than the playing of golf are unnecessary, he forgets that somehow he is overlooking a number of arid spots in his mental life, which a measure of philosophic thought on his part would not be long in calling to his attention and in a way that would make him wince. To prevent this regretful note and to add to the mental peace which we imagine is none too well developed in his busy career, some attention to what he can do naturally,—the furtherance of a predilection, possibly of an artistic nature, that has been lying dormant

through neglect,—may be effective in driving his overwrought mind into channels that will not only benefit him by adding to his joy of living, but be of considerable help to his fellow-men. But, as we said before, perhaps our civilization has not reached the point when this can be done without incurring the stigma of being inattentive to one's real work; though if this were so, why are we so lenient toward those physicians who relax alas! only too often in one direction: the direction that means the deluging of a patient public with popular books on such soul-slumbering subjects as our nerves, our morals and our stomachs!

A CITY HOSPITAL AND WHAT IT SHOULD STAND FOR.

The comments, which invariably arise when the proper conduct of a municipal institution is "on the carpet," are of so variegated a nature that to despair of mankind losing its powers of ingenuity, in the near or far future, is to imagine a mental state which has small probability of occurring. Opinions are so easily formulated and so readily bestowed on those who are willing to receive them, are so individualistic and so colored by some experience that was purely accidental, that they ought to be subjected to the fiercest light before acceptance is possible; and even then only a very small number should be retained whereon to erect the formulas without which no institution can hope to achieve the distinction of being managed according to humanitarian ideas. In case this is done, uniformity of opinion is approached; which is really a happy ending, since simplicity counts for much against a complexity that can only blind the well-intentioned to the real purposes of public institutions. And in all discussions, the purpose of an institution should not be lost sight of; for, if this is clearly outlined, warring opinions will have but a small chance to clog the wheels which should always be in action so that the welfare of the inmates is not hampered.

With these thoughts in mind, it would seem that the stewardship of an institution, that is dedicated to the sick poor or to those whose financial status is not exalted enough to allow them the luxury of one of our private institutions, would be as simple a matter as the uncomplicated arithmetical problem of two and two is four. But such is not the case, if we draw our conclusions from the rather untoward occurrences which invariably obtain when the question is to the fore as to what amount of money should be spent for its upkeep. These occurrences have a pettiness,—in fact, a meanness that does small credit to what we glibly talk about as "our enlightened age"; for can it be denied that, when wrangling of the sort that deteriorates into personalities is the key-note, there are

not overlooked many vital points which should have a better fate than complete submergence? And here it would be well to state that the City Hospital of St. Louis is no exception as a storm-area; for, if we have read its history aright, its progress along the lines which would do it the greatest credit has not been so illuminating a chapter that italics would be justified.

That money is absolutely necessary, if a house is to be kept in order, is a saying that has all the earmarks of a time-honored platitude; but, though one would think that this axiom would by now be part and parcel of human thinking, it is apparently too elusive to be drawn into controversies regarding the keeping of another's house. And surely the conditions which prevail in the City Hospital of St. Louis are such to-day that, in the bead-roll of similar institutions as they obtain in all our large cities, its rank would not be among the elect. We hold no brief for the Hospital Bill, nor are we completely won over by the statements that the amount of money which the city now expends should suffice for all needs; for ours, be it said here, is the attitude of the critic who has the ingenuousness of Oliver Twist when he could not grasp why his demand for more food was refused. This attitude is not one too greatly enamored of the debit and credit sides of the ledger; but it has this in its favor that, despite the absence of an enviable business sense, it breathes a higher humanity than can be taught by mere figures. Between economy and waste, as we know, an alliance is impossible; but it is surely a middle-class conception of the latter to be continually telling us of the disasters which follow in its wake. And even though there is some waste in municipal institutions, would it not be better to tolerate this than do what is now done in administering the affairs of the City Hospital of St. Louis; practise a niggardliness that is wholly out of place when brought to bear on an institution that was never meant for outcasts, but was intended for those lowly (?) elements in the community, who for explainable reasons cannot afford to spend their month's wages for a limited sojourn in a private hospital.

OPINION AND CRITICISM.

THE MEDICINE OF THE FUTURE.

Under the title of "Preventive Medicine: the Medicine of the Future," the hopeful reader expects to read a fairy-tale of the time when disease will no longer exist, when the efforts of therapeutists to cure disease will have been entirely obliterated by the work of the hygienists and bacteriologists in the prevention of disease. It is, therefore, a rather interesting, if unexpected, relief to find Sir James Barr, in a recent number of the *British Medical Journal,* discussing this subject from what must be called an heretic standpoint. He admits, of course, that prevention is better than cure, but he scoffs at certain accepted methods; for instance, he has collected a large series of statistics on the relation of tuberculosis to insanity, and he draws the conclusion from this that the world to-day is not yet ripe for the complete disappearance of the tubercle bacillus. To-day the tubercle bacillus is a sort of guardian angel over the proper development of the race; it kills off in large numbers insane patients, thereby reducing the death-rate from insanity, and preventing propagation of an insane people. In fact, "if you abolish the tubercle bacillus in Ireland it will certainly become a question of 'God save Ireland,' because if you do abolish the tubercle bacillus the insane and the defective-minded will go on multiplying until the race is a race of imbeciles."

It would not serve any purpose to go into detail on the rest of the argument. We will pick out a few sentences here and there. Of pneumonia he says, "The disease is short and inexpensive, so that no one makes much out of it except the undertakers, who grow fat on the misery of others. The case mortality is high, but yet no serious attempt has been made to curtail its incidence." In this sentence Sir James forgets that work is done in other countries besides England. In Germany and America a tremendous amount of work is being done on pneumonia, both from the standpoint of prophylaxis and of cure. Incidentally, he does mention the very valuable (?) pneumococcus vaccines in the prevention of pneumonia. He also speaks very strongly on the use of vaccines as an important part of preventive medicine in diseases in which certainly the present results do not warrant his statements.

A rather pleasant slur on his surgical colleagues follows: "About the only diseases which they attempt to prevent are those which spoil their operations—erysipelas, pyemia and septicemia. The surgeons largely

live on the failures of physicians and general practitioners." This may be true to a partial extent, but he forgets that Lord Lister was a surgeon, and that the practical application of the principles of bacteriology was made by surgical pioneers.

After reading other sentences of this sort, in which bronchitis, pleurisy, rheumatic fever, diseases of the blood-vessels, heart and kidneys, diseases of children, myositis ossificans, and congenital hypertrophic stenosis of the pylorus in infants are discussed, one is left with the decided impression that Sir James Barr believes the prevention of diseases will be accomplished by attention to the calcium metabolism, and by the more general use of vaccines. Americans will hardly agree that the bacillus coli vaccine is often useful in the treatment of appendicitis, or that the science of inorganic metabolism is by any means advanced far enough to consider calcium or potassium or sodium the disturbing factor in disease. But as an unusual contribution to the literature of the day, and as an interesting piece of insular humor, we can highly recommend a close perusal of Sir James' address.

THE AMERICAN NEUROLOGICAL ASSOCIATION ON EXPERT TESTIMONY.

There are numerous ways by which changes looking toward the betterment of present conditions may be brought about. New laws may be passed, publicity of present abuses may be exploited through the press, and efforts planned to create a better standard may be devised. Each and all of these agencies have been actively followed for some years in an effort to modify or change completely one of the greatest abuses of our medico-legal system,—that of expert testimony.

In spite of many attempts, much publicity and debate, this abuse, with a few notable exceptions, has remained very much as it was. Expert medical testimony is yet the primitive plaything of an *ex parte* legal contention, and the physician, whether by design or absolute helplessness, to say nothing of occasional cupidity, is caught in the meshes of an obsolete procedure. He is thus, consciously or not, prostituting the spirit of science, by shaping his knowledge or conclusions to fit a scheme of legal defense which is planned astutely to exaggerate, minimize or exclude facts, not according to their relative importance, but according to a preconceived plan of prosecution or defense. In short, his testimony is not directed to the discovery of facts and conclusions derived from them, based upon the study of a medical problem, but in support of or attack upon a legal theory devised to convict or free an individual accused of a crime.

The American Neurological Association, after carefully reviewing the subject of expert testimony, has set forth as its solution of the problem the following:—

1. That the methods of legal procedure in trials involving neurological testimony are inefficient, tedious and expensive; they fail to utilize effectively expert knowledge and skill and thus make it more difficult to secure justice.

2. That a fundamental reason for the criticisms of medical expert testimony lies in these faulty methods of the law, including the practice of building up cases, the misuse of the hypothetical question and the passing upon technical questions by juries.

3. That the judiciary should by legal enactment be allowed more latitude in enlightening the jury and enabling it to comprehend the nature and meaning of the medical testimony laid before it.

4. That we urge that the medical profession seriously endeavor to secure improvements in the lines indicated, chiefly and primarily in the interests of justice, and because expert testimony is necessary, is helpful to justice and ought to be freely and effectively used in the courts.

5. That whenever possible the medical witness should testify only after he has had an opportunity to make both a mental and physical examination of the person concerning whom the litigation is raised; and that equal rights should be accorded the medical witnesses for both the plaintiff and defendant in the examination of the person alleged to be ill or injured.

6. That we consider the hypothetical question as ordinarily presented to be unscientific, misleading and dangerous.

7. That we recommend as advisable the adoption wherever possible of the so-called "Leed's method" of preliminary consultation by medical witnesses on both sides of the case as to its status.

8. That we advocate a freer use of appointments of commissions by the court.

9. That a period of hospital or similar form of observation of persons whose nervous and mental conditions are mainly subjective, is the best method for securing impartial and accurate opinions; also that we advocate the enactment in every State of laws favoring such method.

10. That it is the sense of the Association that it is inadvisable and objectionable for any of its members to occupy the position of medical advisory counsel in open court and at the same time to act as expert witness in a medico-legal case.

11. That we regard the acceptance by a physician of a fee that is contingent upon the result of a medico-legal case as not in accordance with medical ethics and derogatory to the good repute of the profession, and advocate the regulation of the practice by legislation.

12. That we are in favor of action by medical organizations that will secure a definite standard of qualification for medical men giving expert testimony, such as the following: That a physician should not be considered a neurological expert of the first class, unless he is a graduate of a reputable medical college; has paid special attention to the subject of

neurology for at least six years; has had opportunities of laboratory and clinical study for at least four years, and is a member of some neurological society in good standing.

These resolutions were reported May 13th, 1911, at the recent meeting of the Association. They represent what appears to be the most careful thinking on the subject that has yet been given publicity.

LITERARY NOTE.

The one outstanding quality in Hans Kurella's "Cesare Lombroso: A Modern Man of Science" (Rebman Co.), which has been excellently translated from the German by Dr. M. Eden Paul, is that the reader gets a thorough insight into Lombroso the man,—his ambitions, his struggles for recognition despite prejudice and almost insurmountable obstacles, and his final triumphs. The pen-portrait of this remarkable man is an illuminating lesson to all those seekers of scientific truth, who might foolishly imagine that the road to success is barren of stubbles; for written across it in no mistakable letters is the warning that only by indomitable strength of mind can be overcome the bitter opposition which always follows unconventional thought close at heels. Viewing Lombroso's long life, the note we gather is not one that breathes of peace, but rather one of constant warring against adverse opinions of his studies in criminal anthropology and, especially, of his attack on spoilt maize as the cause of pellagra. The controversies in regard to the latter lasted some thirty years and were not unattended by acrimony; but in 1902 "official recognition was given to his theory by the legislation carried in that year for the prevention of the disease." But could the year 1902 wipe out the wrongs of 1872, when no less a person in the Italian medical world than Porta, Dean of the Medical Faculty of Pavia and a tool of the great landlords, arose in the Medical Academy of Milan directly after Lombroso explained "his experiments and investigations regarding the etiology of pellagra through the consumption of spoilt maize," and accused the investigator "of having artificially induced lesions in the animals he experimented on"? Needless to add that the majority present pinned their faith to Porta's insincere words, and that at the next carnival the pellagrous chicken was even a greater attraction than the most ludicrous harlequin.

ORIGINAL ARTICLES.

ON LESIONS OF THE MID-BRAIN, WITH SPECIAL REFERENCE TO THE BENEDICT SYNDROME.

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Direct experiment upon the structures of the central nervous system of man is necessarily limited, and the results of such experimentation upon lower animals, even those nearest to man, leave much to be desired from the standpoint of interpretation.

Disease, however, is a ruthless experimenter. Its technique knows no refinements, and when its field of operation involves the central nervous system the natural reparative processes do little to overcome the blunders of its workings. Hence the persistence of the defects, and the exasperating struggles in the attempt at therapeutic relief.

There are compensations, however, for the permanencies of disease of these structures make possible definite contributions to nervous physiology and anatomy, which are largely denied by the experimental path, although this latter mode of approach, as carried on in lower animals, rounds out the pictures offered by nature's experimenter, disease.

The mid-brain offers an especially attractive field in this respect, and notwithstanding the complications of its structure, we are in a position to-day to read more clearly the clinical picture that affections of this portion of the nervous system may produce.

The mid-brain is one of the smallest divisions of the central nervous system, yet within it are situated most of the neural mechanisms essential to proper functions. It contains nearly all of the incoming sensory tracts, important stations in the cerebellar paths, the entire group of motor conducting fibres, certain nuclear structures of the sympathetic nervous system, and some nuclei of the cranial nerves. By reason of the compactness of its anatomical arrangements, its lesions are apt to be accompanied by many clinical signs, which offer a series of classical groupings. These groupings offer much suggestive material bearing on topographical diagnosis, and for this purpose lesions in the mid-brain are practically illuminating.

The longitudinal section of the brain stem shows the limitation of this area, bounded caudad by the forward edge of the pons and cephalad by

the upper border of the anterior corpora quadrigemina. The aqueduct of Sylvius penetrates its entire length in its dorsal aspect. On cross section a division into three fairly well demarcated areas is apparent: the cerebral peduncles below, divided by the substantia nigra into the base and the tegmentum, and the anterior and posterior corpora quadrigemina above. It contains two large paired structures, the red nuclei. Its chief nuclear structures then are the anterior and posterior corpora quadrigemina, the red nuclei, the nuclei of the third and fourth nerves, the central grey neuclei, the small nuclei of the fifth nerve, the nuclei of the

Fig. 1. Section of mid-brain at lower level about crossing of superior cerebellar peduncles. (Jelliffe.)

posterior commissure and of the posterior longitudinal bundles, and the substantia nigra. At its upper border it is in close relation to the thalamus, and the median and lateral geniculate bodies, while smaller nuclear masses as yet little known are the dorsal and deep tegmental nuclei and the interpeduncular ganglia of Gudden.

The chief anatomical features may be seen in the accompanying cross sections, which represent the sections taken respectively at the pontine end, the middle, and the upper end of the mid-brain.

Four characteristic syndromes are described for lesions in this region. These represent only the more striking of the many pictures due to lesion in this area. They are the Weber (Gruebler-Weber) syndrome, the syndrome of Benedict, as Charcot names it, the Nothnagel syndrome, as Marburg suggests, and the syndrome of Combe.

The Weber (Gruebler-Weber) syndrome consists of a hemiplegia of one side with oculomotor palsy of the other side. It is one of the commonest of the symptom-groupings of mid-brain disease, and is due either to a lesion of the base, compressing one peduncle at about the point of egress of the oculomotor nerves, or to a lesion within the substance of the cerebral peduncles. The site of the lesion may be seen in the accompanying sketches, which show the areas involved—for instance in a thrombosis of the posterior cerebral artery—arteria profunda cerebri. (Gruenewald: Zur Kenntniss der Thrombose der Arteria profunda Cerebri, *Deutsche Zeitschr. fuer Nervenheilk,* 41, p. 485, 1911; and in a case reported by Cestan, *Revue Neurologique,* 1901.)

The present communication takes up the second of the mid-brain syndromes—namely, that of Benedict. This consists of a Weber syndrome plus a tremor on the side of the hemiplegia; that is some oculomotor palsy, with crossed hemiplegia, and movements usually of the nature of a cross between a paralysis agitans and a multiple sclerosis: a persistent tremor, which increases on motion to a slight extent.

Benedict described this condition in the first edition (1872) of his "Nervenpathologie." He spoke of it as a symptomatic chorea. In his second edition (1874, p. 253) he said "In the first edition of my book, I have expressly stated that following an acute cerebritis in children, a hemichorea can persist, and as a matter of fact this occurs with the definite symptom complex of an acute cerebritis after an exanthematous disease. I have already separated these cases as symptomatic choreas. They constitute chronic affections, and are usually associated with hemiparesis."

I have never seen his original case quoted, so give it here briefly (from his second edition, 1874, p. 311, obs. 214), as his first edition is not available. It is put under the caption "Paralysis Agitans" in the second edition: "V. Feld, four years old, admitted May 29th, 1872. Six months ago was sick with marked headache for four weeks. He had right ptosis at this time, and now has a right oculo-motor palsy and left abducens palsy. The head is sunk against the left shoulder, but could be held upright. The chin points to the right. There are tremors of the left hand. The patient can walk, but not far. The leg is over-extended at the knee, and is in constant motion. Upon executing certain movements, tremor is developed. There is no atrophy, no convulsions, no unconsciousness, no neuroretinitis.

"Next month the patient had a convulsive attack, with loss of consciousness. There was marked dyspnea. Two days later, another similar attack, which lasted half an hour. Following this convulsive seizure,

the patient staggered like a drunken man. Nine days later the patient had another seizure, and was unconscious half a day. He died a month later.

"Autopsy showed tubercles in the frontal lobe, in marginal gyri and in central convolutions; one in the cingulum. A tubercle the size of a pigeon's egg in the right peduncle, extending forward to the posterior perforated lamina. It involved the optic tract, and destroyed the right oculo-motor fibres. The left cerebellar peduncle was pushed to the left. There was involvement of the third ventricle and the right colliculus was pressed upon and partly destroyed."

In 1888 (*Mitth. d. Wien. med. Doct. Coll.*, p. 230) Benedict presented an adult with the syndrome, remarking upon the individuality of the disorder—which he says consists of an oculo-motor palsy of one side, combined with a hemiplegia of the opposite side and a tremor in the paralyzed extremity. In the patient presented the oculo-motor palsy took place three years previously, the left sided hemiplegia and tremor gradually. The tremor has some of the features of a multiple sclerosis tremor in that it is increased on intentional movement.

It may be seen from this short summary that the character of the tremor was somewhat puzzling to Benedict, in that he allied it successively with chorea, with paralysis agitans, and with multiple sclerosis. This uncertainty has not been confined to Benedict, however, for tremors due to mid-brain lesions are of a very diverse nature, as has been well shown by Holmes* and Marburg,** and as I have attempted to bring out in a paper recently read before the American Neurological Association,*** where the whole subject is discussed somewhat at length.

Before going on further, I desire to present the history of a patient, showing the history of the Benedict syndrome, which has however partly cleared up, leaving the tremor and some hemianopsia. Case I.—A. K., aged thirty-two, born in Austria. Her family history shows tuberculosis of the father, who died when she was very young. There were nine children in the family, five alive and well, four died in infancy. Hereditary factors unknown.

Patient was normally born, no eruptions, and learned to walk and talk at the proper time. Read at the age of six. At the age of seven had scarlet fever, was sick three months, and had a meningitic attack of uncertain character which left her very feeble, and an invalid for a year, but she had no paralysis, and no history of any tremor. She had no childish neuropathic signs, did not wet her bed at night, nor have bad dreams. She attended school until the age of fourteen, began to menstruate at seventeen, had had no adult diseases, no history of syphilis, no eruptions or scars. She has never had any convulsions, nor fainting attacks, and beyond an attack of cellulitis and headaches has always con-

*Holmes (*Brain*, 1904).
**Wien. klin. Wochenschr., 1905.
***Jelliffe: On Some Obscure Tremors Due to Mid-Brain Lesions.

sidered herself healthy. The death of her first husband, and the desertion of her second were her only emotional shocks. Nothing suggestive of a hysterical temperament save an incomplete account of two attacks of color blindness.

About two years ago she had a uterine operation, following severe headaches, but made a good recovery, and was fairly well until May 15th, 1910. Her husband was still living with her, and there was no intimation, she says, of any impending domestic difficulties.

Two weeks previously to May 15th, 1910, she had had severe headaches. One morning while collecting rents for the janitor, she suddenly collapsed and was semiconscious for a few moments. She then found that she could hardly walk because of the weakness of the right leg, and that it grew numb, and she lost all feeling in it. She went to bed, and while there the whole right side felt heavy and numb. She was dull and indifferent for several days, and could not feel the right side of her body as formerly. She noted that her right nostril seemed to be plugged up, and that she could not see as clearly as before. She had some difficulty with the right eyelid. The right side of the face and lips, and inside of the mouth appeared less sensitive. No pain. She said her speech was at first slightly indistinct; she stuttered, and could not move the right side of her face. She had no tendency to cry nor to weep. She saw double she thought but was not positive. The headache cleared up rather suddenly.

She was in bed two weeks, and then began to improve, at first being stiff in walking. The sensibility returned in her right side, her speech improved, and became normal she thinks within three months. The sight cleared up after two weeks. (She still has a hemianopsia unknown to her.)

For the past three weeks she has been having some prickling pains in the right arm, and also in the face, but they are not severe. The right hand has perspired more than the left. For two months past says she cannot work as a waitress, as she cannot hold the tray with her right hand, it commenced to tremble, and now she drops things from it. She says she cannot remember things as well as formerly.

Patient was seen October 15th, 1910.

Status Nervovum.—No cranial abnormalities. No painful percussion noted over head.

Smell is normal on each side.

Sight is apparently normal according to patient.

Examination for hemianopsia reveals marked homonymous hemianopsia, and retraction of fields. Wernicke's hemianopic pupillary phenomenon doubtfully present.

There are no scotomata and the fundi are apparently normal. Eye movements normal in all directions. There is slightly nystagmoid twitching on looking to the side. No diplopia.

Pupils are medium to small—3 to 4 mm.—round, equal in size; all

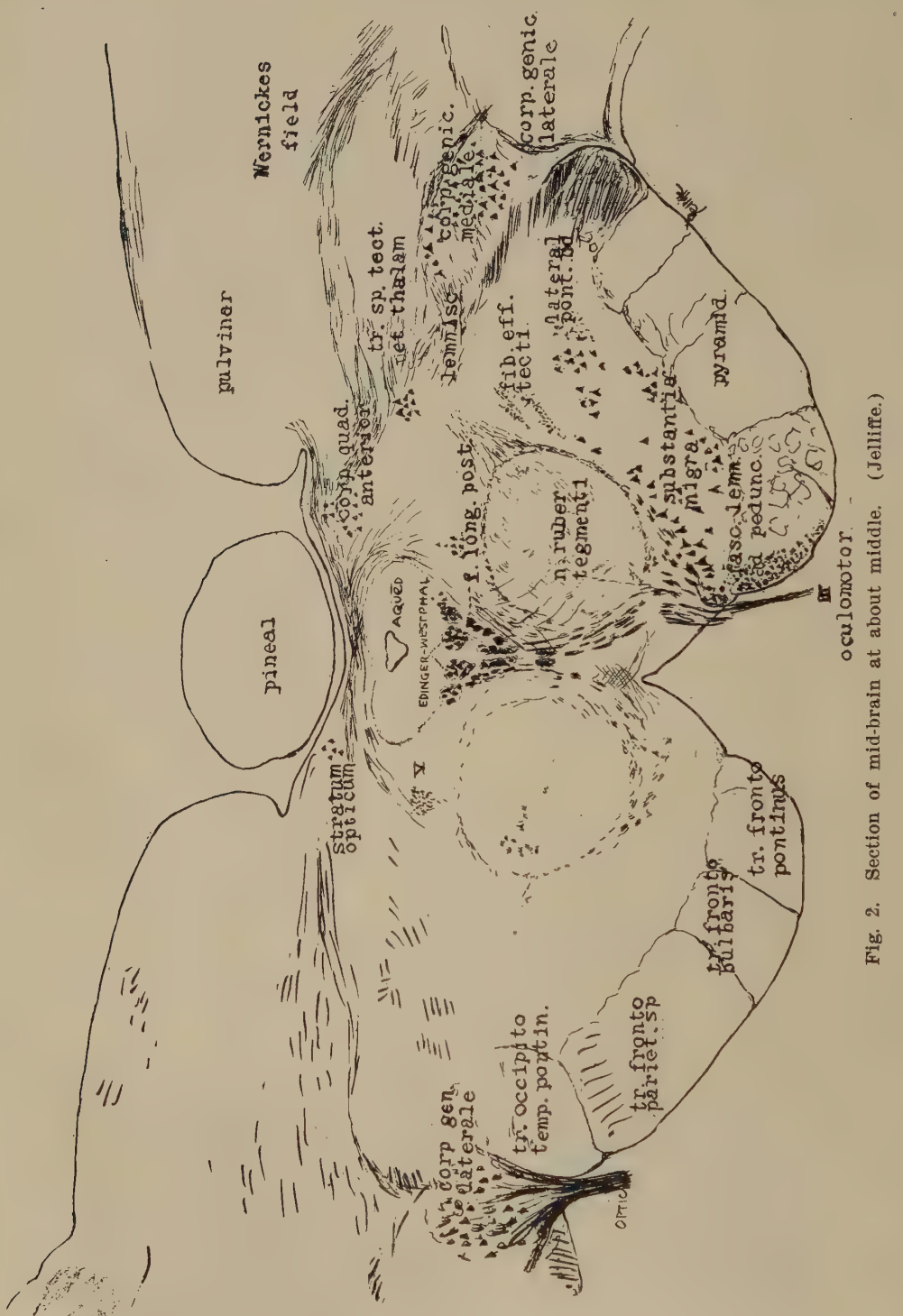

Fig. 2. Section of mid-brain at about middle. (Jelliffe.)

reflexes, light, direct and consensual, convergence, accommodation and sympathetic active and ample.

The trigeminal functions, motor and sensory are intact.

The facial innervation is symmetrical, and no trace of former possible ptosis. Hearing is slightly impaired on the right side. Rinné and Weber are normal. Vestibular function—galvanic and caloric—normal.

Facial reflexes normal, soft palate slightly to right side, tongue protrudes slightly to right. Speech is normal with slight hesitancy at times. Test phrases well pronounced. No sensory aphasia disturbance, no agraphia and no apraxia.

Upper extremities show no atrophies, hypertrophies, spasms nor hypotonus. Muscular power good, equal on two sides. Nerve trunks are not tender. Reflexes present and equal on both sides.

There is a very distinct tremor of the right hand, which is best described as a hybrid of a paralysis agitans and an intention tremor. Left hand intact.

She has no astereognosis, slight clumsiness of right hand, left very deft. Sensibility to all forms of stimulation apparently intact. Slightly increased moisture of right hand and arm pits.

Trunk.—Power normal. No painful points along spine; no unilateral pressure points over mammary or ovarian regions. Sensibility intact; motor power intact; no marked dermographia; abdominal reflexes O. K.

Lower Extremities.—No atrophies, hypertrophies, spasms, nor hypotonus. Muscular power good and equal. Knee jerks equal; Achilles right slightly greater than left. No clonus, no Babinski nor Oppenheim, no painful nerve trunks, no Lasègue. Gait normal forward and backward, with open and closed eyes; no dizziness with different head positions, sensibility intact. No asynergia, and no vasomotor or trophic disturbances.

Status Corporis.—Normal, with question as to slight heart murmur.

Summary.—An apparently healthy woman of thirty-two, with possible mild heart lesion following severe scarlet fever at age of seven, suddenly develops with semiunconsciousness a mild right-sided hemiplegia, with hemianesthesia, hemianopsia and speech disturbance, and crossed oculomotor signs. She makes a rapid recovery, and after three months commences to develop a tremor of the right arm. After five months, then in apparent good health, she has a residual homonymous hemianopsia of the right side, a right-sided tremor resembling that of paralysis agitans, with slight intention quality, and only traces of her former hemiplegia—tongue to right—increased Achilles in right side.

Before discussing the implications of this case, a brief glance may be taken at the post-hemiplegic motor disturbances with which the case is allied, and which have been very extensively treated of in the literature, but which notwithstanding are not definitely located.

It will be recalled that Kahler and Pick believed that these post-

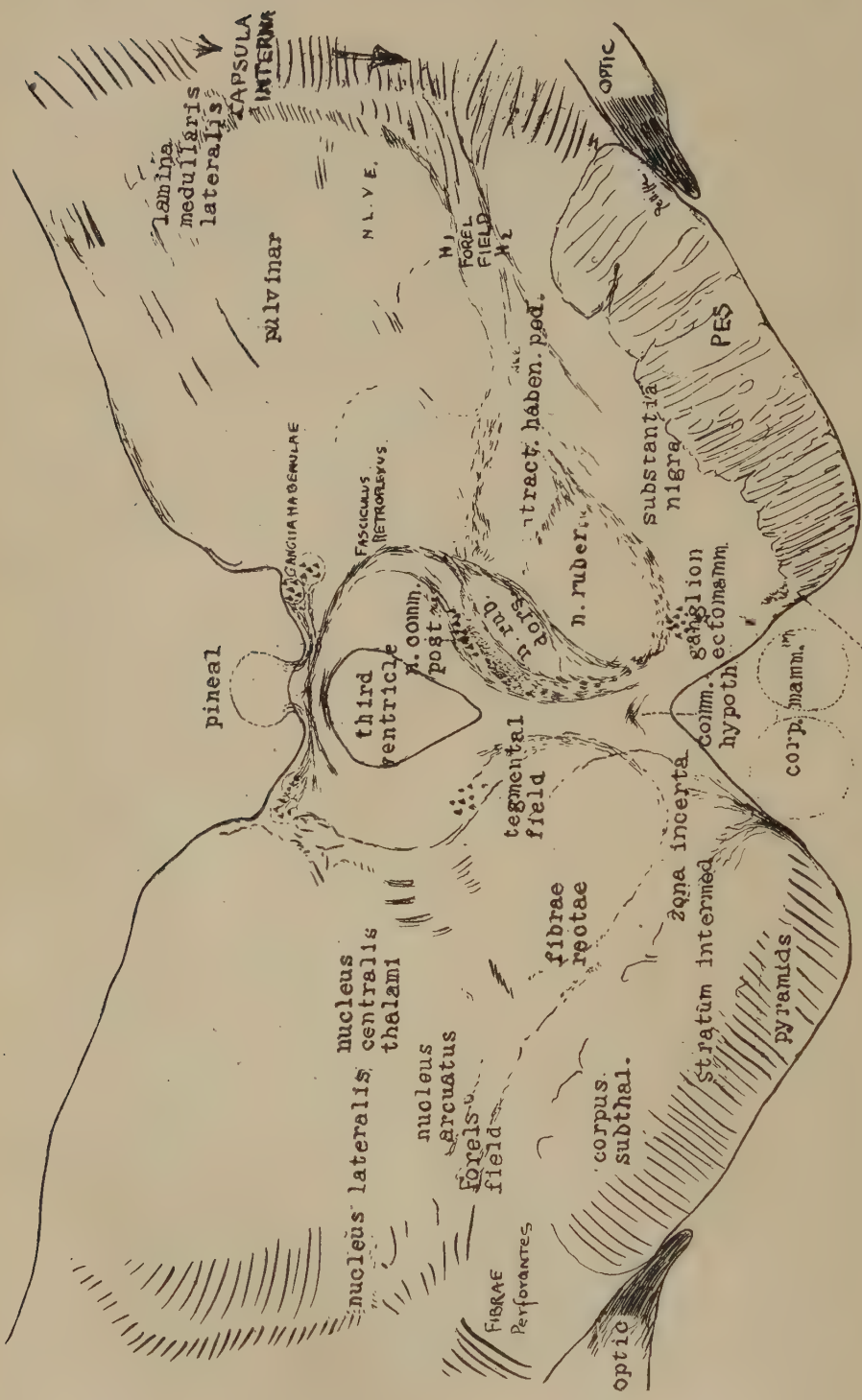

Fig. 3. Upper end of mid-brain; anterior end of red nucleus, showing rubro-thalamic and rubro-cortical paths. (Jelliffe.)

hemiplegic motor disturbances were due to some involvement of the pyramidal system. Charcot later constructed a special path in the internal capsule which, being involved, he thought caused a hemi chorea.

Bonhœffer attacked the problem in1901, and placed the lesion for these motor disturbances in the superior cerebellar peduncle system. It has already been pointed out that the chief station of this system is in the mid-brain, and that it centers about the red nucleus. This structure receives the involuntary tonic innervating fibres from the cerebellum from the spinal side; sends fibres to the thalamus—rubro thalamic fibres, and also sends and receives fibres from the cortex by way of the lenticular nucleus and through other paths not yet completely worked out. (See v. Monakow: Der Rote Kern, 1910.) Caudally the rubro-spinal tract descends

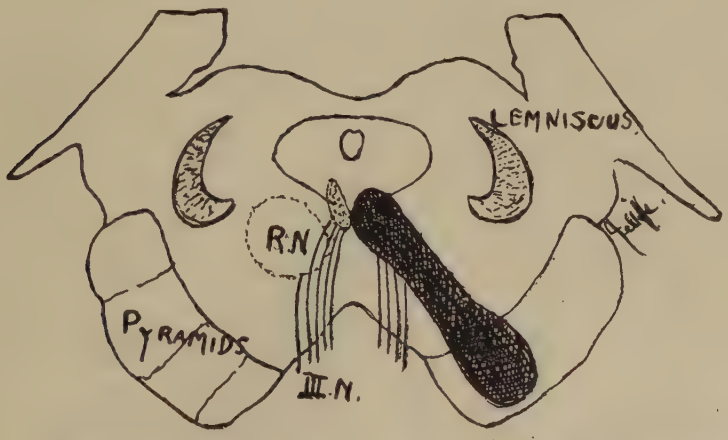

Fig. 4. Gruenewald's case of Weber syndrome. Location of degeneration in black.

to join the pyramidal tract and constitutes the chief tonic reflex path, conveying both cerebello-rubro spinal impulses, and cortico-rubro-bulbo-spinal impulses.

In view of the complexity of these connections the difficulty of accurate localization of these post hemiplegic movements becomes apparent.

A glance at the reported cases shows a variety of movements.* Thus there is simple tremor in the cases of Pilz, Fleischmann, Bristowe, Hoppe, Bonaforte, and Raviard. In the reported cases of Ferrier, Bristowe, Mendel, Gowers, Marina, Biancone, Bruns, Raymond, and Cestan the movement is similar to that of a multiple sclerosis. Again it resembles paralysis agitans in the reported cases of Sorga, Touche, Benedict and Eisenlohr. It had a choreiform and convulsive character in the cases of Vigoroux, Greiwe, Henoch, Benedict, Mohr, Henoch-Grawitz, Laignel Lavastine. It is choreiform in the cases reported by Archambault, Bouveret, Halban-Infeld, Kolisch, N. Bonhœffer, Chapotot, and Ceni, while in a

*Complete bibliography in paper of Jelliffe, l. c.

number it is described as athetoid, particularly in those of Leube, Wallenberg, d'Astros-Hawthorne, Van Oordt, Sorgo, Jelliffe, and others.

It thus becomes evident that a closer scrutiny must be given both to the character of the tremor observed, which fact has been most emphasized by Holmes, and to the exact involvement of the tracts in question.

This appears evident when we note the following divergent opinions. For the sake of clarification we shall consider only three localizations of lesions in this complicated reflex arc (1) Spinal to the red nucleus; *i. e.*, superior cerebellar tract rubro-spinal-bulbo system; (2) rubro-thalamic and thalamo-rubral; and (3) rubro-cortical, and cortico-rubral:

Thus, one scheme is as follows—:

(1) Spinal=athetoid (Wallenberg).
(2) Rubro-thalamic=Tremor (Touche).
(3) Rubro-Cortical=Chorea (Putnam).

Fig. 5. Cestan's case of Weber syndrome. Location of degeneration in black.

Another arranges them as follows:—

(1) Tegmento-cerebellar=Athetosis.
(2) Rubro-Thalamic=Chorea.
(3) Rubro-Cortical=Tremor.

Holmes in collecting the autopsy findings of 60 cases, believes that the evidence points to athetoid movements when the thalamus is involved; to choreic movements when the mid-brain and ganglia are involved, and to tremor when the lesion is in the mid-brain itself. He does not go into the analysis of the tracts as here outlined.

From my own studies I am disposed to class the athetoid movements as due to an interference with the rubro-thalamic and thalamo-rubral fibres. They usually form a part of the thalamic syndrome of Dejerine and Roussy. (See Jelliffe: Thalamic Syndrome, *Medical Record*, 1909.)

Choreiform and choreo-ataxic movements I am inclined to place in the

mid-brain with involvement of the superior cerebellar peduncles; that is when the lesion tends to extend spinally and cerebellarly. Whereas the purely paralysis agitans and multiple sclerosis-like tremors I am inclined to regard as due particularly to the lesions of the rubro-cortical or cortico-rubral fibres, as they sweep through Forel's field, or when the lesion is partly in the nucleus-ruber itself.

Up to the present time, the lesions reported have usually been too extensive to permit close deductions as to the fibre tracts involved—save perhaps in the case of the athetoid movements. Here it would seem that the rubro-thalamic fibres are invariably affected (Hertz). For this reason I am inclined to refrain from taking too positive a position, thus agreeing with both Marburg and Halban-Infeld, that we are not yet in a position to dogmatize.

This brings us back to the consideration of the Benedict syndromes, where, for the most part, the movements are of the paralysis agitans or choreiform type, and where the oculo-motor and pyramidal systems are involved.

The case here reported, however, shows a rather anomalous condition, in that both the oculo-motor and pyramidal symptoms have cleared up, leaving only the tremor and the hemianopsia, agreeing closely with a case reported by Blessing (*St. Petersburg med. Wochenschr.,* 1896).

The latter requires some explanation. It has been found not infrequently with Weber's syndrome. It was present in two of Holmes' cases; Joffroy (*Nouvelle Iconographie de la Salpétrière,* 1898; also *Revue Neurologique,* p. 430, 1900) says it is not infrequent, and refers it possibly to the branches of the posterior communicating which sends branches to the occipital lobe. Brissaud has called attention to the fact that the collateral branches of the posterior cerebral go to the posterior optic tract, and that hemianopsia can result from their involvement. Lesion of the anterior tectal region of the mid-brain can also cause a hemianopsia, and I am inclined to dispose of my case as a lesion of the optic tracts in their ascent to the corpora quadrigemina, and of the rubro-cortical tracts as they sweep out to Forel's field. I shall not exclude, however, a double lesion, implicating the posterior communicating with a lesion of the mid-brain and of the occipital lobes. Furthermore, a basal lesion is not excluded.

64 West 56th Street.

KNEE-JOINT TUBERCULOSIS IN ADULTS.*

By Edwin W. Ryerson, M. D., of Chicago,
Professor of Orthopedic Surgery, Chicago Policlinic; Assistant Professor of Surgery, Rush Medical College.

The purpose of this paper is to present the writer's experience with tuberculosis of the knee-joint in patients beyond the age of childhood and adolescence. It will probably be conceded by this audience that in cases below an age which may be placed arbitrarily at eighteen years, conservative treatment will usually give more satisfactory results than radical operation. In cases beyond this age a well-marked difference of opinion has existed for years in regard to the treatment. With the view of attempting to clear up the matter in my own mind, I have for some time past conducted an investigation into the late results of the ordinary methods of treatment. The available statistics have been examined. The case-reports of my own patients have been read over, selecting only those who have been under treatment at least two years. The opinions and experiences of many of my surgical and orthopedic friends have been inquired into with some degree of care. The attempt has been made to find satisfactory answers to the questions which are of practical importance to the patient, such questions as are usually asked before he makes his decision as to the method of treatment to be adopted.

What shall we tell him as to ultimate outcome of his disease? Will his knee be permanently stiff, or will it be normally movable?

Will there be an actual or potential danger to his life? How long will it take to cure the disease? These questions seem to me to be of the utmost importance to the patient and to the physician.

The results of my investigation along these lines, briefly stated, are as follows:—

A very few patients, with a mildly virulent type of tuberculosis, chiefly synovial, and with very little destruction of the cartilaginous surfaces of the bones, have been cured of the disease and have obtained a useful or nearly normal range of motion. This has required from five to ten years of constant treatment. Personally, I have never seen or treated an adult in whom this result has been accomplished, although I have had charge of a fairly large number of cases.

Practically all the other cases under discussion have either had impairment of motion to a marked and disabling degree or else a complete ankylosis. Those in whom conservative treatment was used have had no

*Read by invitation before the St. Louis Surgical Society, May 10th, 1911.

better results, speaking broadly, than those treated by radical operation, and the duration of treatment has been, as a whole, enormously greater.

At least 25 per cent. of all cases of knee-joint tuberculosis die of tuberculosis or its sequelæ.

We may state to our patient, therefore, that if he has the synovial type of disease with little or no bone involvement, he has a possible chance of being cured by careful, conservative treatment lasting at least five years; if much bone and cartilage involvement exists, he has three chances in four of recovering from this tuberculous infection; that his knee is practically certain to be stiff, and that it will take from five to ten years to cure the disease itself.

It would seem, therefore, if these conclusions be accepted, that the general results of conservative treatment do not justify ordinarily the great economic losses in time and earning capacity among those classes of people where time and earning capacity are of much importance. To the person of limited means and small resources, a course of treatment covering several years is a serious matter. It is among such people that the best treatment is that which restores to them most quickly their earning capacity, diminished more or less by a stiff knee. For cases of this type it would seem that early operation is the course to recommend.

For the patient who has the time and money to spend, it is no doubt proper to allow him to choose the conservative methods, providing that his case is suitable for such treatment. A careful examination must be made to determine the type of disease. The history, the physical examination and the *x*-ray plates will establish fairly conclusively whether the disease is mainly bony, or synovial, or both.

The relative frequency of primary synovial tuberculosis as compared with primary bony tuberculosis is still a matter of some doubt. Kœnig, a man of enormous experience, believed that the one was as common as the other. A few years ago, Nichols, of Boston, demonstrated very conclusively that primary synovial tuberculosis is exceedingly rare. It is impossible to disregard the findings of this able and painstaking investigator, who showed a bone focus in practically every one of the large series of tuberculous knee-joints which he examined, and yet nearly all of us see many cases where clinically the disease seems to exist solely in the synovial tissues of the joint. It cannot be denied, also, that an original synovial infection is theoretically possible, however infrequently it may actually occur.

At all events, when synovial disease is the predominating factor in the individual case, and when the *x*-ray reveals unaltered joint-cartilages, it may fairly be left to the patient to decide upon his treatment. He may be willing to undergo the hardship and expense of conservative treatment exclusively, or for a time long enough at least for his individual resistance and the relative virulence of his infection to be determined. The opsonic

index is not nearly so valuable in this connection as is the careful observation of the subjective and objective symptoms. If, after a few months of immobilization and rest, there is a perceptible decrease in the severity of the symptoms, it may be justifiable to persist in the conservative treatment.

It seems reasonable to believe that injections of certain drugs may have a modifying or a curative action on tuberculous tissue. Although I myself have never seen any convincing results from the injection of iodoform emulsion, many competent and reliable men have reported distinct benefit from its use. The tincture of iodine and Lugol's solution of iodine injected into the joints, have given some excellent results in children at my clinic, and in a number of psoas abscesses in adults, but in the knee-joints of adults they have disappointed me. Murphy's formalin injections have not appeared to do any better than the iodine, and theoretically the formalin would seem likely to harden the tissue to an undesirable degree. Bier's constriction, while excellent in elbow and wrist tuberculosis, has not seemed to benefit any of my cases.

Tuberculin, in very minute doses, is apparently of some slight advantage, although I do not want to advocate its general use at the present time. Spengler's I. K. is under trial, and may be useful when its peculiarities are better defined in joint-disease.

These, or other conservative measures, with, of course, immobilization by cast or splint, and with general hygienic treatment, may be tried in the milder cases without much danger. If they prove unsatisfactory, or if the disease assumes greater virulence, it is my belief that an operation should no longer be delayed, and that a more or less typical excision of the joint should be performed. The exact type of operation does not appear to be of much importance. Ely believes that if the joint be made stiff the tuberculosis will cure itself. He therefore makes no attempt to remove all of the tuberculous tissue, but rapidly saws off a thin slice from femur and tibia and immobilizes the leg. This is a most attractive idea, as it simplifies and shortens the operation materially, but I myself have never been able to resist the temptation to remove as much as possible of the pathological tissue.

It seems wise to make a fairly typical excision of the joint in the average case. I have several times used two Lane plates to secure immobilization after excision of the knee, with very satisfactory results, and I expect to make this a part of my regular technique. Wires and nails have been unsatisfactory in my hands. Many operators make no attempt to fasten the bones together, but rely on the splint or cast to maintain apposition. This is a dangerous practice unless a long spica-cast be applied from waist to toes and even then it is none too safe. With the Lane plates, however, the long spica is not always necessary. A simple circular cast can be used from toes to groin, fitting very closely to the thigh and with little or no padding above the knee.

Drainage should always be employed after an excision, for thirty-six hours or longer if necessary. Neglect of this precaution may lead to serious results. A small piece of gutta-percha tissue, folded into a small cigarette, is better than most other drains. A window is cut on both sides of the cast for the removal of the drains and for the subsequent dressings.

It is of the greatest importance that the immobilization be continued for a very long time, at least six months, and, better, a year; but the cast may be replaced in suitable cases by a sole-leather splint made over a cast of the leg and reinforced with steel strips. It takes much longer to get a bony union after an excision than many authors would have us believe, and if the apparatus be removed in two or three months, more or less flexion is apt to occur, which may need a further operation for its correction.

It will be seen from the foregoing remarks that I am advocating the artificial stiffening of the knee-joint in practically every case of knee-joint tuberculosis occurring in adult life. This must be understood to apply solely to cases where the joint itself is affected, and not cases where a focus exists in the tibia or the femur, which has not yet invaded the joint. In the latter class of cases an extra-articular operation can almost always be performed with success, and the integrity of the joint can be preserved.

The condition of the patient with a stiff knee is not as undesirable as is sometimes supposed. He suffers very little inconvenience except when dressing himself, and he is able to perform many kinds of physical labor with little difficulty.

Moreover, in these present days and future promises of operations designed to transform ankylosed joints into movable ones, it is possible to hold out some hope of restoring a fair range of motion when the tuberculosis of the joint shall have permanently disappeared. It is true that the various arthroplasties are less successful in the knee than in many of the other joints, but Murphy's operation is sometimes successful even in the knee. The method of Baer, of Baltimore, who introduces a joint-lining of chromicized pig's-bladder, is logical, and deserves a wide trial.

It seems possible, therefore, to hold out to the patient some hopes that the ankylosis may not necessarily be permanent, although arthroplasty is hardly likely to become a routine in our generation.

The actual transplantation of joints, as attempted by Lexer, is as yet in its infancy.

We should, in my opinion, fearlessly point out to the patient, no matter in what walk of life he may be, the advantages of a safe, painless and useful leg as compared with one which is dangerous, painful, and disabling.

122 South Michigan Avenue.

A FEW POINTS ON THE MORBIDITY AND MORTALITY OF THE NEWLY-BORN INFANT.

By John Zahorsky, M. D., of St. Louis.

The newly-born infant is singularly liable to a variety of pathogenic influences, which, combined with the feeble resistance offered by many infants, produces a period of life whose morbidity and mortality is much greater than any subsequent period. Thus Prausnitz from German statistics found that out of 10,000 births, 330 infants were still-born and 284 died during the first week of life. In other words, about 3 per cent. of all infants die during the first week. During the second week the mortality reaches 4 per cent.

Statistics teach that while the general death-rate of children has declined very much in the last thirty years, the mortality in infants under one year of age remains stationary. I can find no figures to show the reduction in the mortality of the newly-born, and yet, as regards the premature infant, the number saved has certainly increased judging from Budin's figures.

What is the cause of this high mortality and can anything be done to lessen it?

Of the causes that contribute in the largest measure to the mortality of the newly-born, premature birth undoubtedly has first place. The figures, as to the number of infants born before term, vary much from different sources. Some of these variations may be due to a difference in opinion as to what constitutes premature birth. Thus Miller at Moscow reports 5 per cent., while Fehling in Halle gave as high as 25 per cent. Budin's figures are 10 per cent. In the Bethesda Maternity Home, for the last nine years, 46 cases were treated as premature out of 653 births, or about 7 per cent. If we add thirty-five infants who were born two or three weeks before term, the total number of cases is 81, which increases the rate to 12 per cent., even more than the figures of Budin. During this same period nineteen infants were still-born, that is about 3 per cent., which agrees with the Prausnitz figures.

Statistics from the same institution showed that only eight deaths occurred during the first two weeks of life out of about six hundred infants born at term or near full term. Eleven infants out of forty-six prematurely born died during the first two weeks, which again shows the marked influences of prematurity on the death-rate of the newly-born. If these are added to the eight deaths of infants born at term, it is found that the mortality is 3 per cent., which again approaches the Prausnitz figures.

Another cause of infant morbidity and mortality are the various malformations which afflict the newly-born infant. Among these are cleft palate which often leads to serious nutritive disorders. Imperfect anus and atresia of the gastro-enteric canal in some of its parts demand prompt surgical intervention, and the mortality at best is high. Pyloric stenosis is by no means a rare defect in the newly-born. Deformities of the heart may give rise to serious symptoms soon after birth. The importance of atelectasis pulmonum has in my opinion been overestimated in the morbidity of the newly-born.

The more severe malformations such as acrania, hydrocephalus, etc., are fortunately rare.

Of great importance in the etiology of disease are the birth traumata. Most of these have no ill results if treated properly on surgical principles. Injury to the brain resulting in cerebral hemorrhage may lead to immediate death, but more often to subsequent derangement of cerebral growth and functions. Asphyxia of the new-born infant must also be classed among the traumata.

Another group of causes in the morbidity and mortality of the newly-born are the infections. These do not differ from those in older infants and children except in some of the clinical manifestations engendered by the physical peculiarities of the newly-born. It is a mistake to assume that the young infant is comparatively immune to any infectious disease.

Hereditary syphilis occupies a large place in this category. The infectious diseases may be acquired *in utero* and the clinical features be manifested in the newly-born. I have seen one undoubted case of estivo-autumnal fever transmitted from the mother to the fetus.

Finally acute digestive disturbances occur which may give anxious moments or even prove fatal.

It is clear from this very brief summary of the causative agents which produce disease in the newly-born, that effective prophylaxis is a complicated subject, and it is doubtful that any marked reduction in the death-rate will occur soon. No doubt much depends upon the obstetrician, but a still more important factor is the physical and social condition of the parents, a factor almost beyond our control. The infections of the newly-born should be reduced to a minimum by proper preventive measures, but among the poor and ignorant, tetanus, erysipelas, sepsis, bronchopneumonia, and other infections will always carry off a large number of newly-born infants.

The pediatrician is especially interested in the treatment of disease in the newly-born, and it can be safely asserted that the last decade has materially advanced our knowledge in this direction. In the first place, the case of the premature infant has been placed on more rational principles. The work of Budin, an obstetrician, in this field deserves special mention. His three great laws for the care of the premature infant should be known by every practising physician.

These are in substance:—

1. The premature infant should be kept warm.
2. It should receive abundant nourishment.
3. It should be guarded against infections.

It is well to emphasize here that the most common mistake made by nurses in their effort to keep the infant warm is to overdo the matter. The premature infant is just as susceptible to heat as to cold. How common it is to find a premature infant with a marked elevation of temperature entirely due to the application of too much heat. The feeble infant should not be kept too warm. A difference of at least 6° F. should be allowed between the body temperature and the surrounding air. This leaves a margin for the dissipation of heat from the little body and stimulates internal oxidation. The temperature for the incubator according to Budin should not be over 86° F., and this is safest except for infants weighing not more than 1,200 grm.

It is a common misconception that the incubator is a great life saver. While the regulation of warmth has a high importance, the principal difficulty in keeping the premature infant alive is the supply of food. It needs proportionately at least four times as much food as an adult. The adjustment of the alimentation to the caloric needs of the body is one of the most valuable methods of feeding such cases. It will not do to prescribe a minimum quantity to be given every hour. The physician must know that the infant requires a certain quantity of food having the needed calories, and great pains must be taken to feed the baby this amount.

The premature baby cannot wait three days for its mother's milk. It must have a little food soon after birth. Breast-milk from another woman is best. When this cannot be obtained, whey or peptonized milk may be used. At first the milk is given in small quantities, but it must be increased daily until at the tenth day an alimentation having an energy quotient of 120 calories is administered.

The premature infant most commonly dies of apnea, a sign of exhaustion, which is characterized clinically by cyanosis. These attacks of cyanosis are clear indications that something is wrong in our regime, and inquiry must be instituted at once in the heating apparatus and especially in the food supply. While insufficiency of the food leads to cyanosis, too much food often leads to dyspepsia and this again to fatal cyanosis.

The rearing of the premature infant, weighing less than 2,000 grm., requires the attention of trained nurses and the constant supervision of the physician; it is obvious that this is expensive. This again emphasizes that the reduction of infantile mortality is a sociological problem, and it is needless to state that the solution of these problems is very slow.

It is wise to emphasize that the newly-born are subject to a variety of infections, not usually mentioned in textbooks. A few instances from practice may prove interesting in this connection.

A female infant, five days old, was suddenly seized with high fever and prostration. The disease was puzzling until the urine was examined, when the presence of a severe pyelocystitis was discovered.

Another infant, three days old, began to have bloody and mucous passages which proved to be the beginning of an acute colitis.

A third instance was that of an infant, a few days old, with puzzling septic symptoms due to a suppurative otititis media.

Several cases of acute suffocative bronchiolitis in the newly-born have come under my observation. In two instances the mother had influenza when the infant was born.

A case of estivo-antumnal malarial fever in an infant twelve days old has already been referred to.

Erysipelas neonatorum is a well-recognized clinical condition. Several cases have come under my observation, and, as far as I know, all died. This still remains the most formidable of the diseases in the newly-born.

Anti-tetanic serum has very much reduced the mortality of tetanus. Recently two cases have come under my observation, both of which recovered. The serum should be injected in full doses promptly on the appearance of the first symptoms. On account of the rigidity of the muscles of suction and deglutition, feeding by gavage should be resorted to early, as the rigidity remains for several weeks and the infant may die of exhaustion and inanition.

Hemorrhagic disease of the newly-born seems almost to have lost its terrors from recent reports. It has been found that the hypodermic injection of serum, preferably from a healthy human being, is curative in most cases.

The newly-born infant readily becomes immune to the influenza bacillus and the diplococcus lanceolatus, the most common cause of infection of the respiratory tract. Efforts at keeping up the nutrition and maintaining cardiac efficiency often succeed in carrying the patient through the dangerous period.

The nutritive disturbances of the newly-born may almost entirely be obviated by feeding only the natural secretion from the mother's breast. To oversee the establishment of the proper mammary function is one of the duties of the obstetrician, who will admit that difficulties are common clinical experiences. One of the most important features of the problem it to maintain healthy nipples. In recent years a great mistake, I believe, has been made in prescribing antiseptic measures to prevent excoriations and fissures of the nipple. Lotions of alcohol, witch hazel, and boric acid solutions should not be used. When one remembers how readily the hands become tender and chapped from too frequent washings and the application of antiseptics, it is obvious that the tender mammilla can not endure this practice. The nipples and breast of the mother should be wiped dry immediately after nursed, and washing should be resorted too not more than once daily.

Dr. E. W. Saunders of St. Louis has recently introduced the lanoline prophylaxis. After each nursing benzoinated lanoline is applied to the nipples which is again wiped off before nursing. No washing is done. The success of this method has made him and his assistants enthusiastic over its merits. It certainly is superior to the lotions and powders usually advised.

It should be remembered that the intestinal mucous membrane of the newly-born infant is permeable to bacteria and probably undigested food elements. Infections and various anaphylactic reactions may readily occur. Hence, rigid asepsis in the dietary of the infant is absolutely necessary. When an artificial food is given, it must always be as free from bacteria as possible, that is thoroughly sterilized.

In conclusion I must repeat that the prophylaxis of the diseases of the newly-born is a broad and difficult field, and that the treatment of disease is generally satisfactory when the parents have the means to provide what is necessary.

ESTIVO-AUTUMNAL MALARIA WITH AN UNUSUAL ANEMIA.

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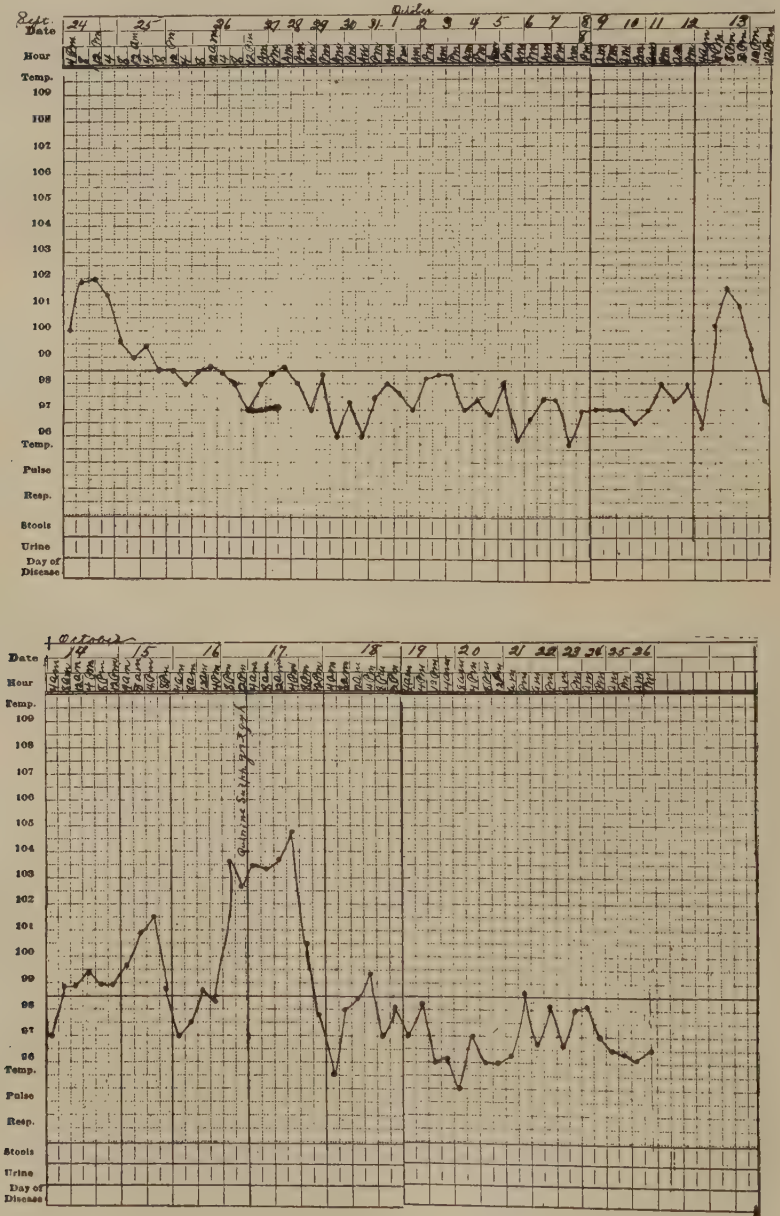
Anemia following one or more attacks of malaria is exceedingly common. The anemia is of the secondary type, that is the decrease in the number of red cells is coexistent with a decrease in the hemoglobin content. Nucleated red cells are not found nor do the red cells show anisocytosis or poikilocytosis. Of the many blood specimens of malaria which I have examined within the past ten years, there have been all grades of anemia and all types and grades of infection with the parasite. This case is the first in which I have found such a blood picture.

The history of the case with the blood examinations is as follows:—

C. H., a white man aged twenty-one and a native of Ohio, entered the Milwaukee County Hospital on September 21st, 1910, complaining of cough and malaria. He has always been well. In August of this year he was working around St. Louis as a railroad construction hand. He was taken ill with chills followed by sweats and fever. Other workmen had similar attacks. For about a week his paroxysms occurred every other day, then they came daily. He was in a hosiptal in St. Louis for two weeks. He then came to Beaver Dam where he remained three days and finally came to Milwaukee. He was ill at the time and was placed in the Emergency Hospital where a diagnosis of malaria was made from the history and he was given quinine. The blood was not examined prior to the administration of quinine. He was in the Emergency Hospital two days before his transfer to the County Hospital.

On admission the patient was seen to be a tall man, slow of speech and considerably under weight. There was a subicteric tinge to the conjunctivæ, and the scleræ were pearly white. The skin had a lemon-yellow tint, the mucous membranes were almost bloodless. The tongue was lightly coated, pale, and moist. No glands were palpable. The chest was broad and flat and the lungs and heart appeared normal. The abdomen was retracted, the spleen easily palpable about 5 cm. below the left costal border. It was firm, the edge rounded, it was not tender. The reflexes were present but sluggish. The urine contained a slight amount of albumin and a few hyaline casts. The temperature was 100° F. when he was admitted in the afternoon. (See chart.) In two hours it rose to 101.8° and by next morning was normal. Careful and prolonged search both in fresh and stained smears revealed no parasites or no pigment. The corpuscles were very pale and there were great differences in size.

The temperature remained normal, the patient quite comfortable except for weakness. In view of the facts that there was no fever, no parasites were found and the appearance of the patient was so suggestive of a grave anemia, a blood count was made. It showed reds 1,520,000, Hb. 38 per cent. (Sahli), whites 4,550, color index 1+. The blood was very pale, watery, and thin, but did not have the appearance sometimes seen in pernicious anemia of a separation of plasma and red cells. A differential count showed polymorphonuclears 54.4 per cent.; small mononuclears



30.8 per cent.; large mononuclears 5.2 per cent.; transitionals 0.8 per cent.; eosinophiles 3.6 per cent.; neutrophilic myelocytes 4.4 per cent.; eosinophilic myelocytes 0.8 per cent. In counting 250 cells one normoblast was seen. There were polychromatophilia and granular degeneration of the red cells, very slight poikilocytosis but much difference in size of the red cells. No parasites were seen. The von Pirquet test was negative. Examination of the stool showed no ova, no occult blood.

A tentative diagnosis of pernicious anemia was made and the patient given arsenic. From September 22nd to October 13th his temperature was normal. Blood-counts are shown in the table appended. No parasites were found. The blood was stained by Hasting's modification of the Nocht-Jenner stain.

On October 5th he was up and around, doing light work in the ward. His weight had increased, the color of the skin was still slightly lemon-yellow and the spleen was palpable.

On the 7th he had a mild epistaxis but otherwise seemed in good condition. A test-breakfast was given on the 9th at 8 a. m. At 8:45 the tube was passed but nothing was obtained and the lavage water returned clear.

For several days he had attacks of mild epistaxis and on the 13th, with no chill or chilly sensation, his temperature rose to 101.5° F., returning to normal in eight hours without sweating. On the 14th there was no paroxysm. The blood was examined and both in fresh and stained smears there were fairly numerous ring forms and hyaline forms of the estivo-autumnal malarial parasite of the tertian type. There were no crescents and no pigment. On the 15th there was a rise of temperature to 101.5° F. without any preceding chill or succeeding sweat. On the 16th numerous parasites were found, some cells containing two ring forms. On the 17th he had a perfectly typical febrile paroxysm as seen by the chart but still there was no chill or no sweat. Quinine in solution was given and except for a rise on the 18th to 99.2° F. the temperature has been normal and the patient is well. The spleen, which was palpable on the 18th, rapidly returned to a size which could not be felt. It will be seen that on the 16th there was one normoblast found in counting 250 white cells. The enormous number of platelets was a striking characteristic of this specimen. No myelocytes were seen. One cell which resembles the megalokaryocyte of the bone-marrow was found.

Parasites were found on the 18th, but on the 20th prolonged search revealed none. None had been seen on further examinations.

The malarial parasite which is classed among the sporozoa, genus hemosporidia, has been divided into three varieties: the plasmodium vivax or simple tertian parasite; the plasmodium malariæ or quartan parasite; and the plasmodium falciparum or estivo-autumnal parasite. This last is now subdivided into two forms, the quotidian and the tertian. The quotidian form is small, very actively ameboid, is ring form, has

Date	R. B. C.	W. B. C.	Hb%	C. I.	DIFFERENTIAL COUNT: Polymorphonuclears	Small mononuclears	Large mononuclears	Transitionals	Eosinophiles	Basophiles	Myelocytes Neutrophilic	Myelocytes Eosinophilic	REMARKS
9-24-10	1,520,000	4,500	38	1 26+	54.4	30.8	5.2	0.8	3.6	0	4.4	0.8	One normoblast; granular degeneration of red cells, very little poikilocytosis, much difference in size of red cells. No parasites.
9-30-10	2,528,000	5,200	55	1.1	60	26	9.6	0.4	3.2	0.8	0	0	Less granular degeneration. No nucleated reds found. Cells more equal in size. No parasites.
10-12-10	3,200,000	5,000	65	1.+	....	....	....	....	....	....	....	....	No differential count.
10-14-10	3,280,000	5,600	65	1.+	63	19	13	1	4	0	0	0	No nucleated red cells. Reds show some variation in size and shape. Signet ring estivo-autumnal parasites fairly numerous.
10-16-10	.....	.....	....	.....	51	23.7	12	4	9	....	....	....	One normoblast. Marked increase in platelets. Polychromatophilia. Many very large mononuclear cells with irregular and mulberry-shaped nucleus. One megalokaryocyte (?), numerous signet ring forms. (See Fever Chart.)
10-17-10	.....	.....	....	.....	....	....	....	....	....	....	....	....	Few parasites. Platelets far less numerous but seem increased. Granular degeneration of red cells rather marked.
10-18-10	.....	.....	....	.....	56	14	23	6	1	0	0	0	Very few parasites. Many large mononuclear cells as above. Some almost denuded of protoplasm. Megalokaryocyte(?).
10-20-10	.....	.....	....	.....	52.4	23.2	16	1.6	5.6	1.2	0	0	No parasites. Slight granular degeneration, otherwise appear normal.
10-28-10	3,764,000	5,300	82	1.1+	65.2	12.4	14.8	0.4	6	1.2	0	0	No parasites. Occasional cell with slight granular degeneration, otherwise normal.
11-5-10	4,724,000	5,800	93	1 +	51.2	14.4	20 0	2 0	11.6	0.8	0	0	Cells appear quite normal.

little or no pigment and sporulates in twenty-four hours. The adult parasites form not more than ten spores, usually six or eight. The tertian form is larger, is only sluggishly ameboid, very early contains pigment, forms the so-called signet ring bodies and has a cycle of sporulation of forty-eight hours. The spores number from fifteen to twenty. These forms can be differentiated under the microscope. Further the type of fever differs. In the quotidian paroxysm the rise is abrupt to a maximum and the fall is also abrupt to normal, the whole paroxysm usually occupying not more than fourteen hours. The tertian paroxysm shows a sharp rise, then a slight fall, then a further and greater rise lasting over fourteen hours, and then an abrupt fall. The paroxysm may last from twenty to twenty-four hours, or even more. Should there be double infection with the tertian form the temperature is usually remittent instead of being intermittent. We are speaking only of the ordinary moderately severe infections. Very severe infections modify the temperature curve markedly.

The blood-changes are interesting. Usually there is a severe anemia of the secondary type. The leucocytes are reduced in number and the large mononuclear forms are relatively increased. These changes are admitted by all observers. In over 2,000 examinations Craig saw 6 cases with a pernicious anemia type of blood. These occurred as sequelæ to severe attacks and all proved fatal. The blood showed no nucleated red cells. The number of red cells reached the low figure of 490,000 per c.mm. There was a relative increase in the polymorphonuclear forms with no leucocytosis. There was no poikilocytosis but there were great differences in size among the red cells. Craig thinks that in certain cases the classical type of pernicious anemia may occur as a sequela to infection with the estivo-autumnal parasite. Cabot maintains that while this does occur it is excessively rare, and such cases having a known etiology cannot be classed as cases of primary pernicious anemia. He says that in none of the 1,200 cases of pernicious anemia analyzed by him did pernicious anemia develop during an attack of unquestioned malaria.

The blood-picture in this case was therefore most unusual. It is also rather remarkable that a count made on November 5th, at a time when the patient seemed, and apparently was, perfectly well should show a color index of 1+. It is possible that he was one of those individuals whose color index is normally 1 or 1+. The finding of myelocytes with nucleated red cells and an anemia with high color index plus general symptoms and signs was certainly sufficient basis for a provisional diagnosis of pernicious anemia. There are febrile cases of pernicious anemia in which the spleen is not infrequently enlarged. Had we had time to make daily careful examinations of the blood we should have found the parasites of malaria before the onset of the first paroxysm.

Another interesting feature of the case is the abruptness with which the quinine stopped the infection. As a rule one does not expect the

estivo-autumnal parasite to be so susceptible to quinine. It is the most resistant form. Here, however, quinine sulphate in solution in 10-grain doses every four hours was begun in the middle of the last paroxysm. There was no further paroxysm. It is generally agreed that in the simple tertian and in the quartan forms one large dose should be given just at the end of the paroxysm while the sporulated forms are still free in the plasma. This in most cases will prevent further febrile attacks. After that the drug should be given for several weeks at increasing intervals. In the estivo-autumnal form is seems best to administer the drug in 10-grain doses every four hours for several doses. The intervals may then be lengthened, but quinine must be taken off and on for several weeks.

It is difficult to explain the rather wide fluctuations in the white cells. The leucocytes remained practically the same and yet the small mononuclear forms varied from 30.8 per cent. to 12.4 per cent., the large mononuclear forms from 5.2 per cent. to 23 per cent., and the eosinophiles from 1 per cent. to 11.6 per cent. Examinations of the stools revealed no ova of intestinal parasites. So far as can be learned, the blood-picture of this case was unique. It demonstrates the value of blood examinations in clearing up a diagnosis and indicating the correct line of treatment to be pursued. We might have considered the case one of malarial fever from the beginning, basing our diagnosis on the history alone. Nevertheless we could not have been sure. The patient would not have had the same incentive to take quinine over a long period of time, and a relapse would have been almost certain to occur. Now he knows absolutely, and with our definite information we can drive home the necessity of prolonged treatment which he will be more apt to carry on because of the very fact that our statements carry the weight of certainty.

TREATMENT OF CANCER HIGH IN THE RECTUM.

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As early as in 1826 Lisfranc[1] extirpated the rectum for cancer. The difficulty in reaching high-lying growths, the unsatisfactory hemostasis and the high mortality acted as a check upon the growth of this branch of surgery while other surgical divisions made rapid progress. Modern surgery of cancer high in the rectum begins with the development of the sacral route by Kraske[2] in 1885. He observed the immunity with which the sacrum could be removed in part in a case where Volkmann inadvertently opened the sacral canal while chiseling away a sarcoma. Following the first report of Kraske the literature of this subject has steadily grown in volume until it forms too great a field to be carried in this paper. Ito and Kunika[3] and Goullioud and Fayasse[4] have presented a review of the literature up to 1905.

Volkmann[5] in 1877 first suggested an abdominal incision in combination with the perineal or sacral route, to determine the extent of the disease. Kœnig[6] was the first to report an operation of this type. In this instance he removed the entire rectum and brought the end of the bowel through the abdominal wall to an inguinal anus. Some years later Jeannel,[7] employing the combined abdomino-perineal operation, removed the rectum and brought the sigmoid down to the anus with sphincters intact.

Since that time the sacral and the abdomino-sacral routes have each had earnest supporters. Most prominent among the advocates of the purely para-sacral operation is Hochenegg. Zinner[8] reports a series of 320 cases of carcinoma of the rectum operated by Hochenegg and his assistants, the largest number reported from any clinic. These cases with very few exceptions were operated by the inferior or sacral route. In a number of instances the abdominal incision was combined but only as an aid in checking uncontrollable hemorrhage. He reports one case in which 17 cm. of bowel were successfully removed by the sacral incision. Kupferle[9] reports 238 cases from the Heidelberg clinic of Prof. Czerny, all of which were performed by the sacral route.

Hartman and Quenu[10] in 1897 and Rehn,[11] Kraske[12] and Jonnesco[13] in 1900 advocated the abdominal incision to tie off the superior hemorrhoidal artery and to determine the extent of the disease. Since that time there has been a growing tendency toward the combined operation. Kraske in a recent paper has advocated the combined operation in selected cases—those lying high in the rectum.

No single operative procedure for all cases of cancer of the rectum should be advocated to the exclusion of all other methods. Each case should be studied with the possibilities of permanent cure, mortality rate and a functionating anus or the best substitute. The perineal, sacral and vaginal routes are best employed in early and in low-lying growths in which anal sphincter control can be preserved. Kraske, Quenu, Mayo,[14] Tuttle,[15] Kuemmel,[16] Schlopfer,[17] Rotter[18] Lusk[19] and Bloodgood,[20] are among those who advocate the combined route in selected cases.

Fig. 1.

The advantages of the sacral route are:—

(a) Rapidity; the operator at once upon the region of the disease.

(b) Danger of infection lessened when peritoneal cavity not opened.

(c) Time to complete operation less than by combined method.

The disadvantages are:—

(a) A bloody field from hemorrhage difficult to control.

(b) Extent of disease not readily determined because of the bloody field; infected glands high up either escape notice or are out of reach.

(c) Interference with the blood-supply of the stump in such manner that gangrene of the bowel follows with death by peritonitis.

(d) Often the bowel can not be drawn down and a sacral or gluteal anus must be resorted to.

(e) The surgeon at times is unable to determine the limits of disease until operation nearly completed; often found that the patient has undergone a mutilating operation which would not have been attempted had condition been fully recognized.

Kocher,[21] Bardenheuer,[22] Schlange[23] and Hochenegg[24] are inclined to favor the sacral rather than the combined operation. Kraske has recently stated that the only method of improving the present sacral method consists in combining the sacral and abdominal procedures and that this has been done frequently in the past in cases which were in extreme con-

Fig. 2.

dition. It was realized that the sacral method was insufficient and as a last resort the combined operation was attempted. The high mortality rate of the combined operation is due in part to this factor. Kraske advocates the laparotomy to be performed first, designedly, and not as a secondary makeshift. When this is done the mortality of the combined operation approximates that of the sacral route and later should be lower. He maintains that the exploratory diagnostic worth of the abdominal incision is alone sufficient to justify combined operation.

Other advantages are:—

(a) Determination of extent of disease, both local pelvic condition and presence of distant metastases. Glandular involvement extending as high as the aorta not always determined by sacral route.

(b) Relations of the arterial system of the rectum. In dividing the superior hemorrhoidal artery to free the bowel and permit the stump to advance to site of new anus, certain vascular relations and variations must be recognized to avoid gangrene. There are some vascular arrangements that mean certain death from gangrene if ligation of the superior hemorrhoidal artery, at the usual level, is carried out.

(c) By the abdominal route the bowel can be loosened more thoroughly. Kuemmel in one instance mobilized the entire descending colon to overcome the defect caused by high amputation of the rectum.

(d) And finally, after the bowel has been freed and pushed down, the

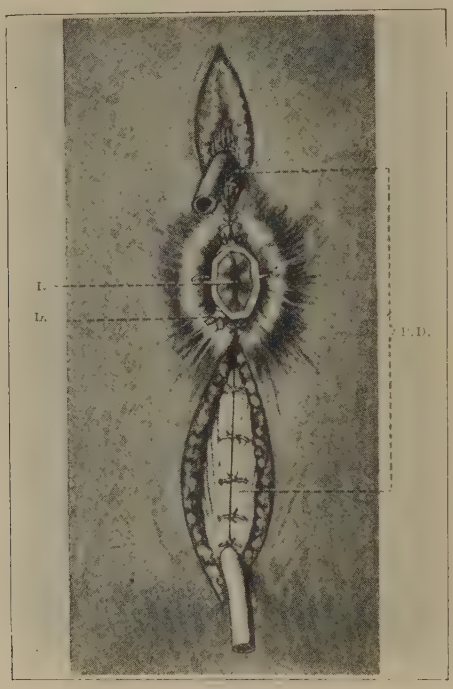

Fig. 3.

peritoneum can be sutured across the pelvis and the abdominal cavity walled off before the sacral route is attempted.

Having once accepted the combined route there remains the question of preservation of the sphincters by resection or by amputation of the diseased bowel and bringing the stump down to or through the normal anus. Zinner reporting Hochenegg's series, states that 62½ per cent. of the cases in which the bowel was drawn down and sutured in the anus, had continent sphincters while but 37.9 per cent. of those subjected to resection had continent sphincters.

Ball[25] has suggested an ingenious method of preserving the nerve supply which is the secret of a competent sphincter. It is best described in

his own words and by means of his illustrations. "The anal canal is plugged with gauze. An incision is made from the base of the coccyx to the back of the anus, and from the front of the anus to the urethral bulb. The coccyx is disarticulated and the levator ani and external sphincter muscles split to the back of the anus and from front of anus to the central tendinous point of the perineum. A stout ligature is, by

Fig. 4.—H—Superior hemorrhoidal artery. S—Sigmoidal artery. L—Anastomosing loop between sigmoidal and superior hemorrhoidal arteries. In this instance the sup. hem. artery bifurcates before the entrance of the anastomotic loop. If resection of the rectum is made below the level at which the two branches of the sup. hem, artery unite to form the vascular network about the rectum, the critical point is at B. If resection is done above the level of the arterial plexus then the critical point is A.

means of these incisions, placed round the rectum above the insertion of the pelvic diaphragm (see Fig. 1). The ligature is tied one-half inch above insertion of the pelvic diaphragm. Vertical incisions are made in the anal canal in front and behind, and the rectum is divided circumferentially just above insertion of the pelvic diaphragm. Each half of the pelvic diaphragm, and external sphincter muscle with its nervous supply

intact is drawn aside, giving free access to the rectum (see Fig. 2). The pelvic colon or rectum, as the case may be, is divided above the disease. The bowel (I) is retained at the anus by a few sutures and the anal canal closed by sutures. The pelvic diaphragm (P. D.) is closed both in front and behind by buried sutures (see Fig. 3)."

Wherever possible every effort should be made to retain the sphincters,

Fig. 5.—H—Superior hem. artery. S—Sigmoidal artery. L—Anastomotic loop. A—Critical point. Ligation of the sup. hem. artery above A admits blood to the sup. hem. artery by way of the sigmoidal artery and the anastomotic loop. Ligation of sup. hem. artery below A results in gangrene of bowel beneath, as blood supply from the middle and inferior hemorrhoidal arteries has been destroyed by the work done in the sacral stage of the work.

but in too many instances preservation of the sphincters has outweighed the possibility of leaving carcinomatous tissue in the patient. If we remove the tumor we must remove every portion of the rectum which contains any evidence or suspicion of malignancy, and all glandular involvement. Fortunately glandular disease occurs late and extends very slowly,

due to the presence of numerous glands at successive levels in the walls of the rectum and between the rectum and aorta.

In those instances where the sphincters must be sacrificed there remain a number of alternatives. Hochenegg has employed the sacral anus (the bowel terminating in back at side of sacrum) in a considerable number of cases and he maintains that fair control is obtained by means of a conical plug held in place by a support. Kraske, Wiesmeyer, Witzel, Peterman and Eiselberg[26] are doubtful of the value of a sacral anus.

Fig. 6.—S—Sigmoidal arteries. H—Superior hem. artery bifurcating high above entrance of L anastomotic loop. A and A1—Critical point according to where ligation is performed.

Witzel[27] has endeavored to obtain better control by drawing the bowel end through the fibres of the gluteal muscles and creating an anal opening in the buttock. This he has named a gluteal anus. This method has not given great improvement over the original sacral anus. Gersuny has twisted the bowel on its long axis giving the feces a corkscrew course in their descent. This has resulted in a somewhat better control.

Hartman, Quenu and Tarikato,[28] with others, have advocated complete extirpation and where sphincter control has been sacrificed they terminate the bowel in the left inguinal region at the site of the average colostomy. This has been termed an iliac anus. According to Bevan and Mayo the average individual when given the choice of determining whether the bowel shall terminate as an inguinal or sacral anus prefers the latter.

Fig. 7.—S—Sigmoidal arteries. H—Superior hem. artery. L—Anastomotic loop in this case is extremely rudimentary. It is questionable whether ligation above A would be safe.

This is probably due to the desire of the individual to have as near a normal condition of affairs as possible.

With an inguinal anus the sigmoid may be drawn through the abdominal wall and the entire rectum completely extirpated with blood-vessels, lymphatics and glands. By this procedure alone in many instances can we hope to eradicate the disease. Carcinoma of the breast was formerly treated in a manner that resembles some of the so-called conservative work on cancer of the rectum to-day. The modern radical

treatment of breast cancer has resulted in a greatly increased number of cures. I believe that where high lying cancer of the rectum is radically treated the permanent cures will be obtained most frequently by complete extirpation of the rectum with its surrounding blood-vessels, fat and lymphatic system, and that this can be accomplished in many cases only by the combined operation.

The mortality of the combined route varies with the sex—a low rate comparatively in the female and very high in the male. The female pelvis is larger and access to the sacral excavation is easier. The vagina offers a means of rapid freeing of the rectum in the sacral stage of the work. In the male the narrow pelvis and the relation of the prostate, seminal vesicles and urethra to the rectum make the operation exceedingly difficult. These anatomical differences are reflected in the statistics of several authors chosen at random:—

COMBINED ABDOMINO-SACRAL ROUTE.

	Sex.		Deaths.
Kraske	Men	7	4
	Women	3	0
Schlopfer	Men	13	8
	Women	10	1
Goullioud and Fayasse	Men	15	2
	Women	16	1
Ito and Kunika	Men	28	18
	Women	22	2

This gives a total of 51 women with a mortality of about 8 per cent., and a total of 63 men with a mortality of about 50 per cent. Hence, in estimating the danger of this operation we should take into consideration the sex as a very definite factor. In my own work I have done the combined operation in two women, both of whom are alive and in good condition. In the second case I carried the end of the sigmoid through the abdominal peritoneum, then made the openings in the internal oblique, external oblique and skin at successively higher levels so that the fecal stream follows a zigzag course and does not readily escape without knowledge of the patient. Absorption of fluid from the intestinal content is about complete in the sigmoid so that the feces are well formed, and slight pressure exerted on the skin lying above the bowel as it passes in its irregular course through the abdominal wall is sufficient to give an artifical control.

The border-line between low tumors to be operated by the sacral route and high-lying tumors to be treated by the combined route has been indicated by Bruening[29] as follows:—Where the upper margin of disease can be reached by the tip of the index finger, the case should be considered as a low-lying growth; all others are fit subjects for the combined procedure.

In closing we repeat the suggestion of Kraske, that the combined route offers a nearer approach to an ideal removal of the diseased tissue and that though its mortality has been high in the past this high mortality

is due in part to the cases in which it has been employed, cases in which it was seen from the start that a sacral operation was insufficient. As an operator repeats a difficult procedure he becomes more experienced and expert and his mortality rate decreases as the number of his cases increases. In reviewing the literature we find that this is true especially in the combined operation.

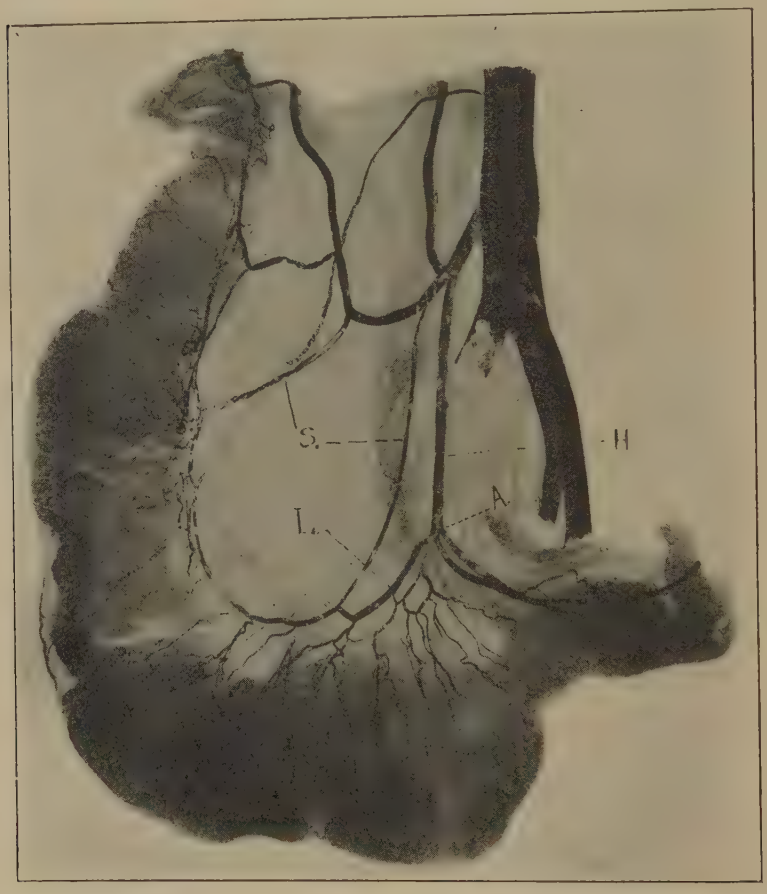

Fig. 8.—S—Sigmoidal arteries. H—Sup. hem. artery. L—Anastomotic loop. A—Critical point.

Appendix.

The repeated report of partial or complete gangrene of the bowel following resection of the rectum by the posterior or sacral method led the author to investigate the vascular relations of the lower bowel. Twenty-one subjects were examined. The vessels were injected with a starch-mass containing lead oxide. In some cases the vessels were dissected out to the bowel wall, while in others the relationships of the

vascular loops were determined by *x*-ray pictures. Some of the more interesting specimens are shown in the text.

Sudeck[30] and Rubesch[31] have called attention to the loop which exists as a rule between the sigmoidal and rectal vascular systems. This is the last arcade or loop of the marginal artery. The point at which the loop anastomoses with the superior hemorrhoidal artery has been called the critical point. Hence, in ligation and section of the superior hemor-

Fig. 9.—This photograph is of a specimen removed at autopsy. The patient died one week after resection of rectum for cancer. Ligations were performed by sacral route at levels indicated by arrows. Entire bowel sloughed below level of arrows. Had ligation been done above A, blood could have passed from loop into sup. hem. artery and bowel would have lived to point of resection.

S—Sigmoidal artery. H—Sup. hemorrhoidal artery. A—Critical point. L—Anastomotic loop.

rhoidal artery, to permit the loop of the sigmoid to be pulled down after resection of the rectum, it is essential that ligation be performed above the critical point (see Fig. 5, A), to avoid loss of blood supply and gangrene of bowel with subsequent death of the patient. Ligation below this point is a frequent cause of death in resection of the rectum as done by the sacral route. Fig. 9 is an *x*-ray photograph of specimen removed

at autopsy from a patient in whom ligation was made below the critical point or region where last collateral blood supply enters the superior hemorrhoidal artery. The superior hemorrhoidal artery was severed, as is usual, to bring down the bowel to the anus. By abdominal incision the location of the critical point can be better determined and the ligatures placed at the proper level.

In twenty-one subjects we found the loop present in 19 cases, and absent in 2 cases. The lowest loop was found in one subject with critical point almost in the bottom of the cul-de-sac of Douglas. Vast majority of other cases showed loop at about 1.5 cm. beneath the promontory of sacrum.

Sixteen subjects showed the loop close to the bowel.

Five subjects showed the anastomosis formed by large vascular loops at a distance from the bowel, demonstrating the value of the old rule to clamp as far back as possible from the bowel to save vascular relation while operating by the sacral route.

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122 South Michigan Avenue.

REPORT OF A CASE OF EXCISION OF THE ENTIRE CLAVICLE FOR SMALL ROUND-CELLED SARCOMA, IN A CHILD NINE YEARS OF AGE.

By N. B. Carson, M. D., of St. Louis.

In the year 1904 I read a paper before the American Surgical Association on removal of the clavicle, and at the same time reported a case of resection of the entire clavicle for sarcoma of the sternal end.

Fig. 1. Showing tumor before operation.

After a very careful search of the literature, on the subject, I was able to collect 49 cases, from all sources reported up to that time. Since then, several papers and reports of a number of other cases have been published, but I am sure that these reports do not include all cases that have been operated upon, as I am personally aware of cases that have not been included in these reports, and, no doubt, there are others that have never found their way into the journals.

Recently I have operated upon another case, in a child of nine years

of age, which involved two-thirds of the sternal end, and had its origin from the periostium.

It was about the middle of April, when I first saw the child at the

Fig. 2. Dotted lines show outline of tumor.

Fig. 3. Tumor bisected.

clinic at the Mullanphy Hospital, and advised that she be entered in the hospital at once; but it was not until May 1st that this advice was followed. In the meantime, the size of the tumor had very materially in-

creased, and after the child had entered the hospital and preparations were being made for the operation, daily increase in size could be noted.

The child was a well-developed, healthy, bright brunette, with a good family history. She had had some of the diseases of childhood, and also typhoid fever when five years old, but had otherwise never been seriously ill.

At the time of removal, May 5th, 1911, the tumor involved the sternal end, and two-thirds of the shaft of the left clavicle, and was about two and a half inches in length, and one and a half inches in diameter.

Fig. 4. Showing slight deformity twenty-one days after removal.
Fig. 5. Showing freedom of motion twenty-one days after removal.

The operation was done without complication, except for the division of a short vein connecting the tumor and the jugular vein, through which opening, air was drawn in, although the calibre of the divided vessel was very small. There was no apparent effect from this.

The child made an uneventful recovery from the operation, the wound healing by first intention except at the inner end, where on account of the thinness of the skin and tension, the sutures cut out, and as a result, this part of the wound healed by granulation.

On the eighth day after the operation, the child was able to feed her-

self with this hand, and on the twentieth day she had full use of the arm. There is very little deformity resulting.

Following is a pathological report made by Dr. Eugene Opie, which he has kindly allowed me to include in this report:—

The gross specimen consists of a tumor encircling the sternal end of the clavicle and approximately 4 cm. in diameter. On section, the bone is found to penetrate the centre of the tumor, and shows no break. The tumor is grayish white and homogeneous on section, forming a layer approximately 1 to 2 cm. in thickness on all sides of the bone. Microscopical examination section shows that the tumor tissue consists of masses of round cells, closely packed together. These masses are penetrated by a delicate stroma. In places the tumor cells form strands penetrating between fibres of voluntary muscle.

Diagnosis: Round-celled sarcoma of periosteum.

REPORT OF ONE HUNDRED CASES OF SYPHILIS TREATED WITH SALVARSAN.

By Francis Cruger Edgerton, M. D., of New York.
Surgeon Cornell University Clinic, Genito-Urinary Department.

I shall not attempt to go into the theoretical side of the subject of salvarsan, as we all know and have read so much about this interesting drug. I shall simply give you the benefit of my practical experience during the past five months, in which period I have devoted considerable time to the observation of these cases. The diagnosis in all has been confirmed either by positive Wassermann reaction or by the finding of the spirochæta pallida in the lesions.

Before giving you the results of treatment in these cases I shall briefly describe the different methods by which we administered the drug. At first we used what is known as the Alt method, which is a slightly alkaline solution diluted to 20 c.c. and given intramuscularly. This method proved so painful in the majority of our cases that we then used the method recommended by Kromayer, that is, suspension of salvarsan in from 1 to 2 c.c. of paraffin oil. The great advantage of this method over the alkaline intramuscular, is the almost entire absence of pain, but following this in a number of cases there were nodules varying from the size of a nut to that of an orange, at the site of the injection. In some cases the nodules persisted a long time. In one case, four weeks after the injection was given, a small abscess not larger than a bean appeared at the site of the injection. This broke and for two weeks a yellowish-white fluid discharged from which no bacteria could be grown. This patient at no time had any temperature and comparatively speaking no pain. We next tried the method which, I believe, was originally recommended by Neisser; the suspension of salvarsan in iodopin, which is a 10 per cent. iodine in sesame oil. We have been able to suspend salvarsan in from 1 to 1½ c.c. of iodopin. Thereafter following this method our patients experienced practically no pain and rarely a nodule remains, and the drug is absorbed much more rapidly than when suspended in paraffin oil. In the last 56 cases, I used only the intravenous method, as there are no after-effects and the symptoms of the disease seem to disappear more rapidly following this method, yet in almost every case there is more or less reaction. Within a short time after the intravenous injection most of our patients have a chill varying from a chilly sensation to that of a marked chill. The temperature varied from 100 to 103° F., reaching its height within six hours. Headache has been an almost

constant symptom, occurring a few hours after the injection but lasting only a very short time. Vomiting has been noted in about 40 per cent. of our cases, in one case so severe that the patient vomited considerable blood. In none of my cases have any of these symptoms been accompanied by any degree of shock. At the end of eight hours all symptoms have usually entirely disappeared and the patient feels as well as before the injection was given. The patients were kept in bed for twenty-four hours, after which time they went about their business as before. In the majority of cases the reaction has been very slight.

The three following cases are interesting if their symptoms are due to salvarsan.

First Case.—Immediately following the injection the patient had no symptoms of reaction and remained perfectly well for four days. On the fourth day the patient had a severe chill and vomited, temperature 103 2/5° F. These symptoms lasted about four hours not accompanied by shock, after which the patient was apparently as well as before.

Second Case.—Patient had slight reaction following injection and went home at the end of twenty-four hours. He felt perfectly well for four days. The fifth day, while eating in a restaurant, he had a convulsion, foaming at the mouth, and according to the person with him, resembling in every way an epileptic fit, although he did not bite his tongue. The patient remained in a semicomatose condition for about three hours after which he felt weak and exhausted, but otherwise there were no after-effects. The following day the patient was perfectly well, perhaps a little weaker, and for the last three months has had no return of the above symptoms. The patient gives no history of epileptic attacks.

Third Case.—This case is very similar to the previous one, except that on the sixth day after the injection the patient, while in a subway station, had an epileptic fit but did not bite his tongue. He remained in this condition about twelve hours not recognizing any one nor having any recollection of what happened. The next day the patient apparently felt all right and has been perfectly well ever since; now about two months. In both these cases the pulse at the time of the attack was about 80, practically no tension, that is, soft pulse; pupils were apparently normal, reacted to light. The urine in the first case was not examined, but in the second, he was catheterized and no albumin or casts found. None of my other cases has shown any late reactionary symptoms.

Regarding the technique of the intravenous method: Having dissolved the salvarsan in boiling hot water, neutralized it with normal sodium hydroxide solution, we diluted the solution to 250 c.c. Having inserted the Schreiber needle into the median basilic vein, we inject 20 c.c. of normal salt solution before injecting the salvarsan, the object being that in case there is any leakage around the needle it will infiltrate the tissues and the infiltration will be with salt solution and not with the irritating solution of salvarsan. When we have injected 20 c.c. of normal salt solution and

there has been no infiltration of the surrounding tissues, we feel sure that we can then inject the solution of salvarsan with practically no danger of infiltrating the tissues. Having injected the required amount of salvarsan, again we inject 20 c.c. of salt solution into the vein, so that in case there is any leakage after the withdrawal of the needle it will be salt solution and not the salvarsan. In the first few cases we injected sterile water instead of salt solution, but invariably there was more or less thickening of the vein at the site of the injection; since we have used salt solution no thickening has followed. I have found that where I inject 10 c.c. a minute there is no increase either in the tension or rapidity of the pulse from the beginning of the injection to the end.

Dosage.—Although the instructions on salvarsan are for intravenous injections, 0.4 grm. for men, and 0.3 for women, we have given much larger doses. I believe it is better to gauge the dose by the patient's weight. To men weighing 150 lbs. or over, I have given the full dose, 0.6 grm.; to women weighing 140 lbs., 0.5 grm., and smaller doses in proportion to the patient's weight.

In reporting these cases I shall divide them into the following groups:—

1. Where the chancre was present, no secondary manifestations. Diagnosis confirmed by excision of chancre and microscopic examination. I have had 3 such cases. In 2 the Wassermann reaction was negative, in one positive. An injection of salvarsan was given. The wound where the chancre was excised healed rapidly and so far has shown no recurrence. In the first case five months have elapsed since the injection, in the second four months, and in the third, two and a half months. In all these cases the Wassermann reaction is still negative.

2. Where the chancre is present accompanied with early secondary manifestation, the blood showing a positive Wassermann reaction. I have had 46 cases, in 20 of which it has been necessary to give a second injection. Of these, 15 had recurrences of manifestations within a month. The other 5 had positive Wassermann reactions at the end of a month, which in my mind was sufficient indication for repeating the injection of salvarsan. The effect of this drug on the primary lesion is very striking. Many times I have seen the chancre heal in from twenty-four to forty-eight hours, but the induration remains much longer, in some cases from ten days to two weeks. In 2 cases following the injection there was a slight improvement during the first two days in the chancre, but at the end of a week it was again ulcerated and larger than on the day I gave the injection. Ten days later I gave a second injection, and not alone were they healed over in forty-eight hours, but within three days the induration had practically disappeared. In one case of labial chancre the result was most brilliant. The following was the history:—

Mrs. S., sore on upper lip, size of a five-cent-piece, covered with a large black crust; ten weeks' duration. Face, trunk and extremities covered with maculopapular syphilides; ulcerating patches on tonsils. Wassermann reaction positive.

February 3rd, 1911, intravenous injection of salvarsan followed by slight chill; no temperature, no vomiting.

February 5th, 1911, two days after injection, chancre healed over, crust having fallen off. Induration greatly diminished. Skin eruption fading rapidly; mucous patches in mouth healed. Patient claimed that twelve hours after the injection she could swallow without pain, which she had not been able to do for three weeks.

March 1st, 1911, twenty-eight days later, patient had no symptoms. Second intravenous injection was given now, four months after the first injection, free of symptoms. Wassermann reaction negative.

The disappearance of the secondary skin eruptions vary greatly in different individuals. For instance, I have seen the macular and papular eruptions disappear in a few cases in twenty-four hours, but in others it has been persistent for a week and in some cases for ten days.

In the following case, January 25th, 1911, the patient had been suffering from sore throat for past month. He denies extra-marital intercourse. Physical examination; no chancre present; trunk and extremities covered with macular papular syphilides. Moist syphilides on scrotum, mucous patches in mouth; spirochæta pallida found in moist syphilides. Wassermann reaction positive.

January 27th, 1911, salvarsan.

January 30th, 1911, three days later, all maculars gone, also about two-thirds of the papulars; moist syphilides on scrotum and about the anus clean and healing. Mucous patches in mouth healed.

February 3rd, 1911, one week after injection, eruption entirely healed.

March 22nd, 1911, seven weeks later, no return of symptoms but has a positive Wassermann reaction; therefore, a second injection of salvarsan was given.

Salvarsan is of great value where mercury and potassium iodide will not control the symptoms. The following case demonstrates this point:—

Mr. S. C., aged thirty-four, primary lesion, September, 1910. Treated since then continuously with inunctions, injections of 1½ grs. of mercury salicylate weekly and potassium iodide by mouth.

February 10th, 1911, five months later, although continuously under treatment, presents himself with face and neck covered with large papular squamous pustular syphilides, also moist syphilides on scrotum and about anus. Salvarsan injected.

February 15th, 1911, five days after injection, eruption on face very much better; moist syphilides on scrotum and around anus entirely gone.

February 20th, 1911, ten days after injection, eruption entirely gone.

March 16th, 1911, five weeks later, patient returns with beginning papular eruptions on forehead. Wassermann reaction still positive; gave second injection of salvarsan.

March 26th, 1911, ten days after second injection, all lesions healed.

April 19th, 1911, two weeks later, no return of symptoms. Wassermann reaction positive.

I have treated 6 cases of gumma of the testicles with salvarsan with rather brilliant results. In all of these cases the swelling had entirely disappeared at the end of a week. In 2 cases there remained a slight hard nodule in the lower pole of the testicle about the size of the end of the little finger where I imagine there had been more or less degeneration, and I concluded this to be scar-tissue that would never disappear.

In 5 of the 6 cases, the swelling at the end of forty-eight hours had diminished one-half in size. The other case showed no change in size for three days and then the swelling disappeared very rapidly so that on the eighth day it had practically disappeared.

I have treated 7 cases of periosteitis, 5 of tibia, 3 of which were bilateral, and 2 of the ulna. One case was in a child eight years old, congenital syphilis. Six of these cases had recurrences within a month, the seventh has remained free of symptoms. The most marked feature is the almost immediate relief from pain. The following history is very interesting:—

A child, eight years old, sickly since birth. One year ago mother noticed swelling, first in one tibia; a few weeks later swelling began on other side. The child was given tonics, mercury by inunctions, mercury by mouth and potassium iodide. At times the swelling would diminish but soon return, the pain always remained. For the last seven months the child has been unable to walk on account of the severe pain in its legs, she was either carried or wheeled in a chair wherever she was taken. The blood-examination showed a positive Wassermann reaction. The child weighed 40 lbs.; therefore, I gave her 0.2 grm. of salvarsan. Two days later the mother brought the child to me and she walked into the room. The swelling had greatly diminished in size. The improvement continued for a month, at the end of which time the motner brought the child back showing me a small swelling beginning in the upper third of the tibia. She said that she thought the child had been running around too much, something she had not been able to do for over a year. Unfortunately it was a recurrence and I advised a second injection.

I have seen 5 cases of gumma of the tongue; in one case the patient had a recurrence at the end of three weeks, the gumma never having completely healed, but three days after the second injection the lesion was entirely healed; and now six weeks after the last injection the patient has a negative Wassermann reaction and no sign of recurrence.

The other 4 cases are still free of symptoms.

I have treated 2 cases of gumma of the iris, which were examined by Dr. Reese both before and after the injection of salvarsan. In each case the gumma had been entirely absorbed and the iris appeared normal at the end of forty-eight hours.

What is commonly called "gumma of the iris" is in reality a papular syphilide, that is, a secondary manifestation.

I have treated 2 cases of syphilitic iritis. In both cases the pain was relieved within twenty-four hours and the iris was pronounced normal; in one case at the end of six days, in the other at the end of eight days. In one case, two months after the injection, the patient developed an iritis of the other eye and required another injection.

Therefore, in my experience with salvarsan, following the first injection, I have seen 23 cases in which recurrences of the symptoms appeared; in these cases the blood gave a positive Wassermann reaction. In 6 other cases, although there were no recurrences of symptoms, the blood examination at the end of a month gave a positive Wassermann reaction,

making in all 29 cases which were not cured by the first injection; but, as far as I have seen, there have been but two recurrences after the second injection was made. As my experience has covered only the short period of five months, it is impossible for me to tell what these case will show in the future.

I believe that salvarsan is indicated in all cases of syphilis where there are any manifestations present or where the blood shows a positive Wassermann reaction, except for example in

(1) Advanced disease of the nervous system.
(2) Marked general debility.
(3) Advanced cardiac disease.
(4) Marked renal disease, unless it is due to syphilis.
(5) Optic neuritis.

I have treated one case in which there was a beginning optic neuritis that Dr. Claiborne examined and has pronounced very much improved, following the injection.

Conclusions.

1. In all my experience with syphilis I have never found any drug which healed the syphilitic symptoms so rapidly and so satisfactorily as salvarsan. When you realize that the chancre, the mucous patch and condylomata lata are in the majority of cases healed over in forty-eight hours, and as these are the active carriers of contagion, you will readily agree with me that the spread of syphilis will be greatly diminished by the use of this drug.

2. From my experience, I believe that a second injection should be given practically to every case and that this should be given within three weeks after the first, except in those cases where following the first injection there have been some bad after-effects.

3. I prefer the intravenous method of giving the drug because the disappearance of the symptoms seems more rapid, there is no pain or any local irritation at the site of the injection, and the effects of the salvarsan have proved to be more lasting and the recurrences less frequent.

As to the absolute certainty of the cure, sufficient time has not elapsed to justify the conclusion that one or even two or three injections of salvarsan will prevent recurrences of the disease either of the secondary or tertiary lesion. Time alone will tell.

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MEDICAL AND SURGICAL PROGRESS.

SURGERY OF THE HEART AND BLOOD VESSELS.

A REVIEW OF RECENT LITERATURE.

By Malvern B. Clopton, M. D., of the Editorial Staff.

1. Sutton: Injuries of the Heart. (*Brit. Med. Journ.*, Vol. V., p. 1273, 1909.)
2. Salomoni: Surgery of the Heart. (*Archives Générales de Chirugie*, Sept. 25th, 1909.)
3. Kirchner: Treatment of Wounds of the Heart. (*Annals of Surgery*, Vol. III., No. 1, p. 96.)
4. Bernheim: Experimental Surgery of the Mitral Valve. (*Johns Hopkins Hospital Bulletin*, Vol., XX., p. 107, 1909.)
5. Bewley: Cardiolysis. (*Brit. Med. Journ.*, Vol. I., p. 915, 1910.)
6. Floeckner: Heart Suture. (*Muench. Med. Wocheńschr.*, Vol. LVI., p. 1634, 1909.)
7. Poynton: On the Operation of Cardiolysis. (*Lancet*, Vol. I., p. 1740, 1909.)

In reviewing the surgery of the heart, one must recognize that up to the present the surgery of the heart has consisted almost exclusively of the treatment of injuries. The field which was opened in 1896 by Farina has up to date recorded 155 operations for injuries with brilliant results in 35 per cent. of the cases, this representing the work of many operators; and practically all of the recoveries were of cases that if left without surgical treatment would have died. For the past twelve years, the mortality-rate has not diminished, and, if there is to be a further improvement in the operative results, our aseptic technique will have to be further perfected as the cause of death in the majority of cases is pericarditis, pleurisy, or pneumonia. These facts have been brought out by Bland-Sutton and Salomoni and Kirchner. Apparently there is no generally accepted route for cardiac approach, but most of the authorities agree that the intercostal method is the most rapid and least mutilating and the simplest of the various methods suggested. The wound, if not large enough, is increased by disarticulating from the sternum one or two costal cartilages. At times, especially for wounds of the base of the heart, it is necessary to resect parts of the ribs and turn them back with the hinge at the sternum. The nature of the wound inflicted often determines the character of the operation. In the mind of most writers, drainage of the wound is considered unnecessary, although a large number of the cases that recovered were drained. (Out of 58 cases of suture

of the heart that recovered, drainage was employed in 30 cases.) Pericardial effusion is frequent after suture of the heart, and it determines the pericardial pain, anxiety and weakness. Various suture materials have been employed, but more recently, the preference has been for absorbable material. When the wound is finished, the stitches should be close enough to prevent further leakage. In many cases, the heart has stopped beating while the sutures were being introduced, but in most instances, slight massage will start the beats again. Injuries to the coronary arteries are usually fatal, but as the coronary arteries are not terminal vessels, their ligation is not contraindicated.

The next developments in cardiac surgery followed a suggestion by Brauer in 1903, who proposed the excision of the overlying ribs and part of the sternum for cases of adhesive pericarditis with angina and a marked diastolic precordial bulging with a systolic retraction. This measure released the heart from adhesion to the chest wall. Morrison, in 1908, suggested that in cases where the heart was greatly enlarged, for example, in aortic stenosis regurgitation with marked ventricular hypertrophy and anginoid pain, that the heart be released from too confined an area by removal of the ribs that overlay it. These suggestions have been followed by eighteen operations; mostly cases of adhesive pericarditis. The operations have varied in their methods. Through a curved incision, a large thoracic window is made by taking out the fourth, fifth and sixth ribs and cartilages, and sometimes the third and seventh. While the original suggestion was that the ribs be removed with the periosteum. Thorburn who has given us the last article on the subject, sees no reason why the periosteum need be removed; as in several of the cases, including one of his own, the ribs did not reform and in one of Koenig's cases where he left the inner layer of periosteum, he found two and a half years later when the patient died, that there were only a few bony spicules. General anesthesia has been used in most of the cases. Peterson and Simon started their first case under local anesthesia and had to complete it under general anesthesia. (The reviewer has on one occasion resected about six inches of the sixth rib under cocaine for relief in a case of mitral stenosis with a large heart, and much discomfort. It was possible to do this operation in a case where conditions were most unfavorable without any disturbance to the patient, and it appears a much safer procedure than to give a general anesthetic.) Recently Bewley has reported a successful result in such a case as Morrison indicated should be operated.

Bernheim reports on the operative methods which he has used to attempt to narrow the auriculoventricular orifice, which is the most difficult of all valvular lesions to reproduce. This work was undertaken to answer Brunton's question, Can a mitral stenosis be transformed by surgical methods into an insufficiency with benefit to the patient? The question has not been finally answered, but on numerous occasions it has been possible on dogs to constrict the mitral ring by a suture, and in some of the cases it has been possible subsequently to divide the constriction; but they were not able to reproduce the typical presytolic murmur, or the usual symptoms characterizing the stenosis in man. Hence, the question of symptomatic benefit from this procedure still remains unanswered, for the lesion that have been made have merely led to a degree of stenosis to which the heart promptly accommodates itself. The work was done before Metzer's method of tracheal insufflation was devised, but the anesthesia was accomplished by intubing through a tracheotomy wound after the chest had been opened (since the heart has to be approached via

the pleural cavity). Artificial respiration was continued until the heart lesion was made, and the pericardium and pleura dealt with. The greatest difficulty encountered, in passing the cardiac ligature by which the stenosis was effected, was from wounding a coronary vessel or from tearing the cardiac muscle. A particular form of curved needle having an eye and a fixed handle similar to an aneurysm needle, was devised and proved to be more accurate in use. Silk that had been dipped in vaseline was used and passed beneath the coronary vessels so as not to produce a constriction and an infarct. Thirty attempts to produce stenosis have been made; two or three succumbed to post-operative shocks, a number died from empyema, a few at a later period from thrombosis formation, and ten recovered and lived from a week to three or four months. In only one case have they successfully reoperated for the stenosis, and in this case with perfect recovery.

A curved thin knife is passed into the apex of the left ventricle through the arms of an untied mattress suture; the stenosing ligature is cut and the knife withdrawn, the suture being immediately tied. This operation is easier to carry out than the stenosing operation; it takes less time, the hemorrhage is easily and accurately controlled, the post-operative vomiting is low. This is a point in favor of the future possible operation in man, and it is encouraging to think that in the event of such an undertaking, although we have to deal with a diseased and overburdened heart, the procedure offers no greater technical difficulties than a number of others which are in daily practice.

Carrel has been experimenting with the idea of finding such methods as could be used for the treatment of certain diseases of the heart and aorta. As very early diagnosis is now possible, it is probable the aneurysms of the thoracic aorta could be extirpated and the circulation reestablished by a vascular transplantation, if the proper technique was developed, It seems possible also that some valvular and vascular diseases of the heart might be improved by surgical therapeutics. The bad results following intrathoracic operations are due to a lack of adaptation of technique to physiological conditions in the chest. Pleural infections are the most dangerous complications. In 100 fatal cases of wounds of the heart treated by suture, death was the result of sepsis 60 times. It is therefore necessary to use in vascular and intrapleural operations better asepsis than is practised in many hospitals and laboratories, and the success of the more complex intrathoracic operations depends on the observance of a number of minute details of technique. The handling with forceps or retractors, the sponging or walling off with gauze, the exposing of large surfaces to the air, bring about irritations of the pleura and facilitate greatly its infection. As soon as the thoracic cavity is opened, the lungs must be covered with fine Japanese silk compresses impregnated with vaseline, as the silk tissue acts as a thin and almost impermeable membrane which protects the pleura without irritating it against the contact of the fingers, and permits of very efficient walling off of the operative field. In order to prevent the cooling of the pleura, a piece of thick flannel is placed on the silk compresses, and the temperature of the operating room is very high. Blood must not be allowed to flow through the pleural cavity as sponging to remove it may be a cause of infection. His operative results have shown that these precautions have brought about a great reduction in the mortality-rate in experimental work. The other complications which makes this surgery more difficult, is the respiratory disorder caused by the penetration of air into the thorax. In Carrel's

work, he has found that the intratracheal insufflation of Meltzer and Auer has given much better results than either the over- or under-pressure apparatuses devised to prevent respiratory complications. Working with the idea that some early aneurysms of the aorta can be extirpated, he has been successful in resecting this vessel and transplanting in its place a vein or other vessel which has been preserved in cold storage. It is necessary to modify the ordinary technique of vascular suture to meet the conditions in the aorta, and every detail of the technique must be directed toward the prevention of secondary hemorrhage which occurs more frequently after suture of the thoracic aorta, and rarely happens after suture of the abdominal aorta or other vessels. The main danger of the aortic operation does not come from the heart or from the aorta itself, but from the central nervous system. Spastic paralysis developes when the descending aorta has been clamped for more than ten or fifteen minutes due to a degeneration of the cells in the anterior horn. It seems that clamping of the ascending aorta cannot be continued without danger for more than one minute. Therefore, it is necessary to have a technique for the temporary diversion of the blood. One method is to lay the vessel open with a longitudinal incision and insert into its lumen a paraffined tube which is temporarily fastened. Then the wall of the aorta can be extirpated and replaced while the circulation goes on through the tube. When the operation is completed the tube is removed through a small incision. The patching or the transplantation of aortic segment can always be performed in less than an hour, while the circulation can go on for several days through the tube before coagulation occurs. It is a safe and convenient method for the descending aorta and can probably be used also on the ascending aorta. Another method of continuing the blood in circulation while segment of the aorta is being operated, is to establish a communication between the left ventricle and the descending aorta. One end of the vessel or of a paraffined rubber tube is inserted into the apex of the left ventricle and is fastened; the other end is inserted into the descending aorta, and the ascending aorta is slamped reversing the blood-stream through the upper part of the descending aorta. There is therefore no danger of anemia of the brain. The operation is difficult and the mortality heavy; nevertheless, he has succeeded several times in anastomosing the left ventricle to the descending aorta, and the circulation has been thus maintained for eight minutes. The clamp and tube were then removed and the circulation was reestablished in its normal direction. This method is more difficult and dangerous than the aortic intubation. In six experiments, the transverse suture of the descending aorta was performed after complete or incomplete section. One dog died of secondary hemorrhage a few weeks after the operation; the others recovered completely. The aorta was patched with a vein twice, both animals dying after eight and twelve days from secondary hemorrhage due to a necrosis of the flap in one, and tearing of the stitch in the other. Graft of a complete venous segment between the cut ends of the descending aorta was performed once, and the dog is still alive and in excellent health, and there is no modification of the femoral pulse. It seems possible that certain aneurysms of the aorta in man may be removed and replaced by a piece of vein with the help of the methods for temporarily diverting the blood.

Plastic operations on the heart are not much more difficult than on any other part of the body, according to Carrel, but to perform the operations without disturbing in an irreparable manner the functions of the nervous

system and of the heart itself is a very complicated problem. Of those operations which do not require temporary hemostasis, he has tried only one, which is an operation for mitral insufficiency performed without opening the heart. It can be done by resecting a part of the walls of the ventricle just below the coronary artery. A dog which underwent this partial ventriculectomy two months ago is still alive and in good health. Other operations which require a temporary hemostasis of the heart are only partially successful. He believes it would be feasible to cut a mitral or tricuspid valve, or to perform a curettage of the endocardial vegetations. The hemostasis can be secured by clamping the vena cava as advocated by Sauerbruch, but he believes it is simpler to clamp with a large soft-jawed forceps the entire pedicle of the heart, as the interruption of the circulation does not last more than two minutes, and it causes no cerebral complications. The main danger is the occurrence of fibrillary contractions which render almost impossible the reestablishment of normal pulsations. In operations which require interruption of the circulation for a longer time, he shows that as yet no method has been devised. The technique for these operations on the heart is very far from being developed, and the purpose of presenting them now is only to study some of the principles on which must be based the future surgery of the thoracic aorta.

THE SPINAL ARTICULATIONS, POSTURE AND STATIC DISTURBANCES.

A REVIEW OF RECENT LITERATURE.

By NATHANIEL ALLISON, M. D., of the Editorial Staff.

1. Redard: Traumatisms of the Spine in Railway Accidents. (*Zentralbl. fuer Chir. und Mech. Orth.*, p. 74, February, 1910.)
2. Adams: The Functional Spine. (*Boston Med. and Surg. Journ.*, p. 80, January 19th, 1911.)
3. Engelhard: The Position, Form and Mobility of the Vertebral Column in the Sagittal Plane. (*Zeitschr. fuer Orth. Chir.*, Bd. XXVII., H. 1-2, 1910.)
4. Evans: Neglect of the Sacro-Iliac Joint by the General Practitioner. (*Medical Herald*, July, 1910.)
5. Hemmeter: Anthropometric Studies on the Osseous Proportions of the Human Body, with a View to Obtaining Mathematic Expressions for the Enteroptosis. (*Bost. Med. and Surg. Journ.*, October 6th, 1910.)
6. Rotch: The Comparison in Boys and Girls of Height, Weight and Epiphyseal Development. (*Archives of Pediatrics*, August, 1910.)
7. Goldthwait: A Plea for Greater Care in Arranging Patients on the Operating Table for the Prevention of the Common Post-Operative Weak Back. (*Journ. Amer. Med. Assoc.*, Vol. LVI., pp. 642-644, March 4th, 1911.)
8. Goldthwait: The Lumbo-Sacral Articulation, An Explanation of Many Cases of Lumbago, Sciatica and Paraplegia. (*Boston Med. and Surg Journ.*, March 16th, 1911.)
9. Meisenbach: Sacro-Iliac Relaxation, with Analysis of Eighty-Four Cases. (*Surgery, Gynecology and Obstetrics*, Vol. XII., No. 5, May, 1911.)

Redard believes that traumatic hysteria of the spine is a very rare condition. This type of spine is often referred to as railway spine. He has seen but two cases and these presented deformities of the spine similar to those seen in hysterical scoliosis. Kummell's disease is distinct and different in its development and origin from this condition. He believes that Kummell's disease is usually a latent tuberculous spondylitis, the activity of which is started up by the trauma. This is followed by an increasing deformity and symptoms, also by disturbance and metabolism and pain. A radiogram is necessary to establish the diagnosis, and it should be taken under conditions which minimize the dangers of faulty interpretation.

Adams believes that a diagnosis of osteo-arthritis should not be made without verification of *x*-ray findings. The average person of the laboring class is, on the whole, rather tolerant to a moderate amount of pain.

After proprietary medicines and plasters have failed to produce permanent relief, he presents himself at a clinic and places his hand over the region of the lower dorsal and upper lumbar spine as indicating the area of his pain. This pain he describes as being in the nature of an ache, or a stiffness in attempting to straighten up from a stooping posture. He notices it most upon getting up in the morning. Examination shows a limitation of motion in the spine, as evidenced by flexion in all directions being stopped by muscle spasms. Forward and lateral bending are limited, but hyperextension is not limited. Many of these men are teamsters, engineers, tailors, etc., the character of whose work necessitates the constant use of their back muscles, the strain being often increased by sudden change in temperature and exposure to heat and cold. Adams reports 25 routine cases treated at the Boston Dispensary. All of them presented the classical symptoms: pain, muscle spasm and limitation of motion, in varying degrees of intensity, and in all of them the *x*-ray showed nothing. In these cases a marked hyperemia was produced by local plastering and application of heat, and a light pelvic belt was supplied as an adjunct to the treatment. Adams is against using rigid apparatus, with its untoward effects on these cases. He believes that unless the back shows the symptoms, and unless, also, the *x*-ray reveals an osteo-arthritis, these patients will do better with light support and counter-irritation.

Engelhard gives a method of distinguishing the normal from the pathological vertebral column. Examinations were made of healthy children between six and fourteen years, in profile, by an apparatus which projected the spinal column as a whole, or in segments, on a glass mirror. This device is made by a straight rod, at the ends of which are two short rods of equal length, at right angles to the first rod. The end of one of the short rods touches the spinous processes and the corresponding end of the other short rod records a mark on the mirror. He has used the first cervical, the first thoracic, the first and fifth lumbar vertebræ and the beginning of the anal fold, the claviculo-sternal notch, the xiphoid cartilage, the umbilicus, the symphysis, the anterior-superior and the posterior-superior spinous processes and the trochanter as landmarks. All these points were brought into relation with a perpendicular erected at the middle of the trochanter and variations from this perpendicular were noted. The position of the spine in extreme forward and in backward bending was noted. In examining the segments of the spine, a line was stretched over the segments and the perpendicular dropped from the height of the arch thus formed, resembling a bow. In this way an average was obtained of the amount of curve in numbers of such segments. The curves of the spine are in intimate relation with the angle of inclination of the pelvis, which Engelhard found to be 32 degrees. The normal height of the arch of the lumbar vertebræ is 2 to 5.5 cm.; in extreme backward bending 4.5 to 6.5 cm. In the thoracic segment the height is 7 to 11 cm.; in forward bending 18 to 41 cm., and in backward bending 2 to 7 cm. Though the author has not arrived at any definite conclusion from his measurements, he has given us a method of determining the type of spine possessed by any case under examination and has pointed out the advantages of calculating the spinal curve in studies which involve the consideration of enteroptosis and static disturbances.

Evans calls attention to the fact that the medical profession in general has not as yet recognized the disturbances caused by injury, or diseases of the sacro-iliac joints; also that the anatomy of the joint is not

very fully given in any English or German works. The French, however, have studied it very carefully, on account of their frequent employment of symphyseotomy, the sacro-iliac joints are true diarthroses, which permit a rotary movement of the sacrum between the two ilia. This joint is liable to strain and produces symptoms such as pain, either local or referred, swelling, abnormal mobility, or limitation of movement.

Hemmeter states that enteroptosis is not limited exclusively to displacement of viscera in the abdomen, but includes also the thoracic organs. He believes it to be an expression of congenital osseous, visceral nerve and vasomotor abnormality. Acquired enteroptosis is comparatively rare, and then only shows displacement of a few organs in the abdomen. In the acquired form the thoracic organs, as a rule, are in normal position, while in the hereditary, and more frequent type, the thoracic organs also are displaced; the bony proportions of the body are decidedly abnormal.

Rotch, in an interesting paper on the development of the boy and girl, comparatively speaking, shows that the girl passes the boy at puberty and reaches the period of full development prior to the boy. When about seventeen, the boy passes the girl in height and weight, and the epiphyseal growth in girls is in advance of that of boys from the first year until the sixteenth or seventeenth year, the girl maturing sooner than the boy. He insists that there is a marked correlation between the mental and epiphyseal development, and that girls and boys should be graded according to the stage of their epiphyseal development.

Goldthwait, in his plea for greater care in arranging patients on the operating-table, calls attention to the fact that the position in which the patients are placed at the time of the operation has much to do with the presence or absence of post-operative backaches and subsequent weakening of the sacro-iliac joints. The positions in which strain will not take place are so easily obtained that there is no possible excuse for such harmful conditions occurring. He shows an apparatus in which the lithotomy position can be maintained indefinitely, without either strain to the patient or to the assistant. This strain is caused by sharply flexing the thigh, and at the same time abducting it. The assistant is apt to rest his weight on the leg as he reaches over to assist the operator. In order to correct this strain, the thigh should be less sharply flexed, and a bandage, or strap, should be attached about the knees, to prevent marked abduction. Also in the ordinary flat position on the operating-table the thigh should not be hyperextended, thus drawing the axis of the pelvis forward. This can be prevented by placing under the back a support, which prevents the sag of the spine, and one also under the knees, so that hyperextension is prevented. Observance of this simple suggestion will relieve many patients of the extreme and lasting backaches which follow long operations in the recumbent position.

The same author in a paper on the lumbo-sacral articulation, makes it clear that this joint varies greatly in its stability, depending upon peculiarities in the formation of the articular processes and of the transverse processes, and that these peculiarities not only result in less than the normal strength of the joint, but may represent mechanical elements which not only produce strain and cause pain, but may lead to such great instability that actual displacement of the bones may result, with, at the same time, a separation of the posterior portion of the intervertebral disk. In such displacements, if the fifth lumbar slides forward upon the sacrum—spondylolisthesis—the condition is usually compensated for and pressure upon the cauda equina, or the nerve-roots,

does not occur. If the displacement be upon one side, the spine must be rotated and the articular process of the fifth is drawn into the spinal canal with such narrowing that paraplegia may result, or the crowding backward of the intervertebral disk alone may be so great as to cause similar paraplegia, but of more gradual development. Weakness of the joint, or partial displacement may cause irritation of the nerves inside or outside the canal, and produces bilateral leg pains, often called sciatica. This observation is based upon the history and development of an individual case that presented the dislocation of the lumbosacral articulation, with a complete paraplegia.

Meisenbach, in a very comprehensive article, covers the whole subject of sacro-iliac relaxation in a very thorough manner, taking up the anatomy, the case-history and therapeutics of this condition. He has observed 84 cases and has drawn the following conclusions: The sacro-iliac joint is a true joint and normally admits of some motion. It may be subject to strain, or complete subluxation, as well as to the diseases which affect other joints. The pelvic girdle is the main support of the trunk, and when relaxed, either by disease or physiological processes, the sacro-iliac may become loose, or subluxed. Many cases of sciatica are due to slipping of the sacro-iliac joint, and many backaches, especially in women, are caused by sacro-iliac strain. Faulty attitude and flat-foot may be causative factors. The degree of motion in the sacro-iliac joint varies greatly. Motion is usually more marked when the patient attempts to walk, a pendulous abdomen may strain the joint, giving rise to subjective symptoms. Direct or indirect muscular violence is one of the common causes of strain in these joints, as is likewise a general debility, whether due to the weakening results of disease or general suboxygenation. Gynecological cases which present symptoms of backache which have not been relieved are very often the result of trouble in the pelvic girdle. The diagnosis in these cases must be carefully made with due reference to paramount symptoms, the analysis of which may help to establish the diagnosis. In cases presenting vague symptoms of backache which cannot be accounted for, a thorough physical examination may disclose the chief trouble to be in the sacro-iliac joints. Early diagnosis in cases with mild symptoms is important, as chronic invalidism and neurasthenia may thus be prevented. In the acute cases, with sharp pain and spinal curvature, early treatment may give immediate relief. All cases of sacro-iliac relaxation should not be treated dogmatically by fixation. Sacro-iliac strain is more common than is generally supposed, and is found in both old and young. When existing, patient will not make a permanent recovery until the pelvic girdle has been properly supported and the joint strain relieved.

THE TREATMENT OF UNDESCENDED TESTICLE.

A REVIEW OF RECENT LITERATURE.

By John R. Caulk, M. D., of the Editorial Staff.

1. Moschcowitz: The Anatomy and Treatment of Undescended Testicle; With Especial Reference to the Bevan Operation. (*Annals of Surgery,* December, 1910.)
2. Katzenstein: Kryptorchismus. (*Zentralblatt fuer Chirurgie,* No. 31, 1910.)
3. Davison: Surgical Treatment of Undescended Testicle. (*Surgery, Gynecology and Obstetrics,* March, 1911.)

Judging from the numerous operations which have been proposed for the relief of undescended testis, it is evident that an ideal method has not been obtained. The operation which has enjoyed the best favor and has secured the most satisfactory results is the one proposed by Bevan in 1903. Within the last year, Moschcowitz has reported a series of excellent results which were obtained by this method. In spite of this and similar reports, we find that our supply has not been exhausted as a very ingenious method has recently been proposed by Davison of Chicago, which seems to be a most sane and scientific procedure.

Concerning the surgical pathology of this malady, a few words may not be amiss. The body of the testicle is usually smaller and softer than its fellow, but preserves the so-called testicular feeling. It is generally quite movable, and in many cases it has a distinct mesentery. The epididymis is as a rule well developed. The vas deferens is always of sufficient length. This is a very important point, as great stress has been laid on the vas deferens as an important factor in the retraction of the testicle after operation, but this has been disproved. The Bevan operation gives evidence that the vessels are at fault and as a rule the vas is not the offending agent. Katzenstein recently made the assertion that the vas is the important factor in the retraction of the testicle. The processus vaginalis has been claimed by some surgeons to be an obstacle to the replacement of the testicle at operation. Moschcowitz thinks this erroneous and gives the following reasons why:—

1. It does not take into consideration the different lengths of the sac.
2. The testis is in reality a retroperitoneal organ, and its motility cannot therefore be affected by something outside of it.
3. Even when the neck of the sac is freed and ligated, the testis is no nearer to the bottom of the scrotum than before.
4. The most practical of all, he says, that he has never found the sac to give him the slightest difficulty in mobilizing the testis.

The spermatic cord is usually spread out in a fan-shaped manner and as a rule is very delicate. The vessels are poorly developed. One of the most important observations and the one on which the Bevan operation is hinged, is that the spermatic vessels are deficient in length, and ap-

parently by the distance between the testis and the bottom of the scrotum. The scrotum varies in size, depending on the presence or absence of a hernia, and on the size of the hernia. The scrotum, however, usually adapts itself to circumstances and affords no obstacle to the operation.

Reasons for Operating.—1. Every undescended testicle is accompanied by a hernia, either actual or potential according to Moschcowitz, and this requires operation.

2. The undescended testis is more subject to trauma than the normally situated one.

3. The testis possesses two functions: The elaboration of spermatozoa, and the maintenance of the sexual characteristics. In the undescended testis it is thought that the spermatogenetic function is practically absent. This has been proved by Haines in experiments on pigs. However, the interstitial and Sertoli cells are thought to preserve the sexual characteristics. Therefore, the preservation of this function is an indication for a conservative operation. Whether or not the replacement of the testis within the scrotum restores its spermatogenetic function or not, is not absolutely proved.

4. The not infrequent development of malignant tumors in the undescended testis.

5. The liability to accidents, such as torsion of the cord.

6. Extension of a gonorrhea or a metastatic involvement from mumps is much more grave in the undescended testicle. Extreme youth is a contraindication to the operation. The age of selection for operation varies with different operators, from three to nine.

A brief résumé of the various operative procedures is as follows:

1. One of the first methods was that advocated by Langenbeck which consisted in massage, manipulation, and the application of a forked truss, to retain the testis. The results by this method were unsatisfactory, the truss causing much discomfort to the patient and retaining the hernia unsatisfactorily.

2. Orchidectomy has been done a great deal for this malady, but its objections are so apparent that they need not be mentioned.

3. Replacement of the testis within the abdomen with closure of the internal ring has been suggested and carried out. There is no advantage to this except that it cures the hernia, but the testicle is exposed to all the dangers which might befall a non-descended organ, and it is in a more dangerous locality for trouble to ensue.

4. *Shueller's Operation.*—It was thought that the open tunica vaginalis was the cause of the non-descended testis, and in this operation the peritoneal prolongation is divided at the internal ring and a new tunica formed by the lower part, the testis anchored to the scrotum by sutures. This is only applicable when the testis is already close to the scrotum. There are many modifications of this operation, such as suturing the fascial structures of the cord to the external ring and suturing the undescended testicle to its fellow on the opposite side after incising the septum scroti.

5. *Lanz's Operation.*—Sutures are passed through the testis. These are passed through the scrotum and left long and fastened to a wire cage or to the thigh, the idea being to exert continuous traction in order to lengthen the cord. This operation has many recurrences.

Starr fastens the testis to a wire splint which is fixed on one end to the pubic bone and at the other to the scrotum.

6. *Keetley-Torek Operation.*—This operation consists in liberating the

testis, correcting the hernia and the fixation of the testis to the skin-flap on the thigh with the idea that the fixation will lengthen the cord. At a second operation the scrotum and testis are liberated from the thigh and the testis replaced in the scrotum. This operation has a very uncomfortable post-operative course for the patient, on account of the traction and dragging on the testis, the very awkward gait, the eczema which often develops and the danger of infection.

The Beck necktie operation according to Moschcowitz at best can only hold the testis outside of the external inguinal ring.

7. *The Bevan operation,* which is the most familiar and the most satisfactory, consists in isolating and freeing of the hernial sac with closure of the peritoneal cavity in the usual way. The distal part of the sac may be cut off close to the testis, may be cut some distance from the testis and new tunica vaginalis made, or it may be inverted and sutured. The isolation of the sac is very important, as one has to be very careful in separating it from the vas, since the ultimate viability of the testicle depends upon the artery of the vas, and, if this is injured, the result will be necrosis of the testicle. Otherwise, as Moschcowitz has shown in his experiments, there is not a general necrosis but in some instances a slight central zone necrosis with the periphery in a fair state of preservation. The operation will not be described in detail. The substance of the operation being that the vessels are ligated and the vas left untouched, the vessels being the obstacle to the replacement. The work of Griffiths and Hill has shown that the artery of the vas is sufficient for the preservation of the testicle. The results of this operation have been very satisfactory. The testicle remains low in a great majority of the cases done by experienced operators and the results have been most pleasing.

Just recently Davison of Chicago has proposed the most ingenious method of dealing with undescended testicle. He recognizes as the main cause of the retraction, the shortness of the cord from its make-up at the internal inguinal ring to the testicle, and his method is a transplantation operation whereby the spermatic vessels and vas are brought together at the external ring instead of at the internal ring. Ligation of the vessels of the cord interferes with the lymph and nerve supply of the testicle; and he thinks if this can be obviated, as by transplantation, the preserving of the component parts of the cord means that a great deal has been accomplished. The operation is as follows:—

The inguinal canal is exposed by dissection as in the Bassini operation for inguinal hernia. The testicle and cord are freed. The posterior wall of the inguinal canal is treated very similar to the Fowler operation. After ligating the deep epigastric artery, an incision is made through the posterior wall of the inguinal canal from the external ring to the pubic bone, just beneath the site of the external inguinal ring. This destroys the internal inguinal ring and exposes the peritoneum with the vas and spermatic vessels riding on it. The vas is easily separated by gauze from the peritoneum until its desired length is obtained. The spermatic vessels are then sponged loose from the peritoneum by gauze carrying with them lymphatics and nerves which are preserved. A bed for the testicle is made in the scrotum and silkworm gut suture is passed through the gubernaculum testis and both ends are passed through the most dependent part of the scrotum. Testicle placed in the scrotum, the posterior wall of the inguinal canal is repaired, the cord is made to come through at the lower angle of the incision. The internal inguinal ring is closed, the conjoined tendon is sutured to the underside of Poupart's ligament

above the cord, the fascia of the external oblique muscle is sutured to the edge of Poupart's ligament above the cord, and the skin wound is closed. A strip of adhesive plaster is placed around the thigh just above the knee with a flap on the inner side of the thigh. To this is fastened a thin rubber band to which the sutures from the scrotum are tied with sufficient tension to make the band taut. A light plaster-of-Paris cast to prevent flexion of the thigh and intermittent traction on the gubernaculum is employed. Davison in his article presents three patients and his results seem excellent.

HAY FEVER.

A REVIEW OF RECENT LITERATURE.

By WILLIAM B. CHAMBERLIN, M. D., of the Editorial Staff.

1. Dunbar (*Deutsche med. Wochenschr.*, No. 9, 1903).
(*Berl. klin. Wochenschr.*, Nos. 24, 25, and 28, 1903).
2. Mayer (*New York Med. Journ.*, August 8th, 1903).
3. Rochussen (*Pharmaceutical Review*, XXVI., p. 167).
4. Semon (*British Med. Journ.*, I. p. 713, 1903).
5. Somers (*The Laryngoscope*, May, 1906).
6. Stein (*Chicago Medical Recorder*, February, 1905).
(*Chicago Medical Recorder*, July, 1908).
(*Interstate Medical Journal*, July, 1910).
7. Weichardt (*Berl. klin. Wochenschr.*, XXXVI., 1906).
8. Wolff-Eisner: Das Heufieber, p. 71. (*Internat. Centralbl. fuer Lar. Rhin.*, p. 402, 1905.)
9. Yonge: Hay Fever and Paroxysmal Sneezing. Wm. Green & Sons, 1910.

The near approach of the hay-fever season calls again our attention to that disturbing, if not fatal, periodic affliction and confronts us with two questions: (1) What is known in regard to the etiology of the disease; and (2) what advances have been made in its treatment.

The etiology of hay fever seems to be fairly well settled and may be stated in brief as follows: (1) An irritating cause, consisting principally of the pollen of certain grasses and weeds, included mostly under the order of Graminaceæ; and (2) an individual who is especially susceptible to this irritation. Many theories as to the cause of hay fever have arisen from time to time, but the pollen theory seems to be the only one which has stood the test of time and careful investigation. Leastwise, it is the theory which at present is most universally accepted. In regard to individual susceptibility, it is an undisputed fact that hay-fever victims are found in an overwhelming percentage among those in the better walks of life, among brain workers rather than manual laborers. In addition there seems to be some susceptibility which might be designated as an "hyperesthesia of the nasal mucous membrane to the pollen of various grasses." Of course such contributing causes as heredity, race, social conditions, as well as a more or less neurotic temperament should be taken into consideration.

The symptoms of hay fever are too well known, even to the laity, to necessitate repetition. In the United States the attacks occur at two seasons of the year: (1) The late spring or early summer, when they are usually known under the name of "rose cold"; and (2) in the late summer, usually beginning between August 15th and 21st, when they are known as "hay fever." An unfortunate complication of the latter variety, es-

pecially is a so-called hay asthma, which may cause even more annoyance than the hay fever itself.

The treatment of hay fever at the present time may be included under five heads: (1) The nasal treatment; (2) the antitoxin treatment; (3) serum treatment; (4) alcohol injections and cauterization; and (5) climatic treatment. No advances have apparently been made since the introduction of pollantin in 1903 by Dunbar, of graminol some time later by Weichardt, and the injections of alcohol along the nasal nerve and its branches, as suggested in 1908 by Stein.

(1) *Nasal Treatment.*—Many hay fever victims are the subjects of nasal malformations and new growths of various sorts. To say that the nose of every subject is abnormal, or that a nasal abnormality exists in every such case would be wide of the truth. The majority of such cases, if examined in the intervals, are found to possess nasal structures apparently normal in every way. Doubtless some nasal abnormality is found to be the underlying cause in a fair proportion of cases, such lesions being obstructive in character, as deflected septa, polyps and polypoid hypertrophies, or inflammatory, *e. g.*, diseases of the nasal accessory sinuses.

In a certain number of cases the correction of the nasal abnormality or cure of the underlying disease will serve to relieve the patient of his attacks. It should be beneficial in all cases. The cases should be carefully examined before the beginning of the expected attack so that there may be complete recovery from any operative interference before the attack has its incipiency. It is superfluous to add that there should be no operative interference during the seizure. Yonge has reported certain good results from the bilateral excision of the nasal tubercle, though he considers that he has tried this procedure on too limited a number of cases to draw too general or definite conclusions.

(2) *The Antitoxin Treatment.*—In 1903 Dunbar, of Hamburg, first published his investigations in regard to a specific antitoxin, later introduced to the profession under the trade name of pollantin. Having previously convinced himself that the disease was due to the pollen of certain grasses, he succeeded in isolating a toxic albuminous substance which reproduced in animals symptoms similar to those observed in human beings. Later by injecting the pollen of certain grasses into horses, he succeeded in producing an antitoxin which, when introduced into the nose and conjunctival sacs of human beings during an attack, caused the disappearance or amelioration of the symptoms of the disease. Pollantin is obtainable in a dry, as well as a liquid form. The treatment in predisposed subjects should be instituted seven to ten days before the beginning of the attack and carried out during its progress. A general résumé of the published statistics shows good results in 62 per cent. of cases, fair results in 23 per cent., and no result in 15 per cent. The treatment should be carefully carried out according to the directions which are to be found on each package.

(3) *The Serum Treatment.*—Some time after Dunbar's investigations, Weichardt introduced a serum which is now known under the trade name of "graminol." "Weichardt believed that there existed in the blood of cattle, fed on the grasses ordinarily used for pasture, a substance which might be protective against hay fever. A serum was therefore prepared from the blood of such animals, without any previous inoculation or other preparatory treatment being practised." According to reports of the German Hay Fever Union there were favorable results in 75 per cent. of cases, while in 38 per cent. there was complete relief.

(4) *Alcohol Injections.*—In 1908 Otto J. Stein, of Chicago, reported favorable results from the injection of alcohol along the branches of the nasal nerve. The sensory nerves of the nose are derived anteriorily from the nasal branch of the first division of the fifth, posteriorly from the spheno-palatine ganglion. By injecting alcohol into or near these nerves Stein was able to relieve or ameliorate the symptoms in a certain proportion of cases. The technique of the operation presents considerable difficulty in certain cases. Such a procedure would doubtless decrease the sensibility of the nasal mucous membrane, an end which has been sought by other observers by means of cauterizing certain hypersensitive areas on the surface. Killian has cauterized certain areas, the anterior part of the septum, the anterior end of the middle turbinal, the outer wall slightly above the middle turbinal, and the upper part of the septum above the tubercle, with trichloracetic acid with favorable results.

(5) *The Climatic Treatment.*—There are certain cases which none of the foregoing procedures seem to relieve. For such cases the only relief possible is the selecton of some lacality where the pollen season is later than at the permanent residence of the sufferer, and a sojourn there until after the first frost, when return is fairly safe. A sea cruise during the hay-fever season offers similar relief. These measures are attended with no little expense and inconvenience. For the individual of limited means they are quite impossible, and the only recourse is the avoidance, as far as possible, of all dust- or pollen-laden air, and the relief, as far as possible, of the various symptoms as they arise. Cities, especially the more densely populated districts, will accordingly be found more favorable localities than suburbs, country villages and towns.

Among agents which give temporary relief may be mentioned cocaine, eucaine, and adrenalin. The former may be mentioned only to be condemned. Whereas it undoubtedly gives temporary relief, the dangers, especially the cocaine habit, arising from its use make its employment impossible. Eucaine, while only half as toxic as cocaine, is a vasodilator rather than constrictor, so it does not give the relief derived from cocaine. It should be condemned for reasons similar to those applying to cocaine. Adrenalin, or the allied extracts of the suprarenal gland, gives marked relief, but unfortunately this relief is only temporary. It is a question, too, whether the congestion after the vaso-constriction has passed is not greater than that preceding its use. But this temporary relief is often a great boon to the sufferer and helps to tide him over until the time when the first frost eliminates the pollen and gives him relief.

PRACTICAL MEMORANDA.

SPINAL PUNCTURE AS AN AID TO DIAGNOSIS OF INTRACRANIAL INJURY.*

By Vilray P. Blair, M. D., of St. Louis.

In suspected intracranial injury, valuable information is sometimes furnished by inspection of the cerebrospinal fluid.

The first puncture is to be made in the fourth lumbar space. If the fluid is deeply colored with blood, it shows profuse intracranial hemorrhage. The force of the stream sometimes gives evidence of the intracranial pressure. If the first fluid is slightly bloody and later it is less so, this is evidence that the blood is due to an injury in making the puncture. Therefore, the fluid should be taken in two tubes, a small quantity in each. If the fluid taken from the fourth space is clear or shows only accidental contamination, the needle is to be inserted into the second lumbar space where sometimes bloody fluid will be obtained; the removal of some of the fluid from the fourth space having allowed the blood to travel down the spinal canal. As in the first instance, this fluid should be gathered in two tubes.

The microscope is of little value in differentiating between accidental contamination from the puncture and contamination from the blood that is in the fluid before the spinal puncture is made, for upon examining the blood-cells which had been in the cerebrospinal fluid for various periods of time—from an hour to four days—no change in the form of the red corpuscles was evident. The microscopical examinations were made by Drs. Harris and DeWitt.

In severe intracranial hemorrhage it may be difficult or impossible to obtain any fluid by spinal puncture after twenty-four or forty-eight hours.

VENOUS TWIGS AT DIAPHRAGMATIC LEVEL, INDICATING HEPATIC SCLEROSIS.

By A. L. Benedict, M. D., of Buffalo.

This sign, reported by the writer some years ago, is often overlooked, although the caput medusæ at the umbilicus, occurring only in extreme cases, is classic. On exposing the chest, there is seen an approximately horizontal row of venous twigs, each dendritic form being one to three centimetres in diameter. The twigs are usually most prominent in the nipple line, diminishing toward the mid-line in front, and the anterior axillary lines. Communications between adjoining twigs are more or less marked.

The caput medusæ is due to the establishment of a collateral circulation between the paromphalic branch or branches of the left division of the portal trunk, via the round ligament and the epigastric terminals. The venous twigs at the diaphragmatic level are much more commonly seen—

*From observations made in the St. Louis City Hospital.

if looked for—or, in other words, they develop much earlier in the course of portal obstruction. The collateral circulation is by way of the accessory portal veins of Sappey, which drain the peritoneal folds and areolar tissue about the liver and communicate with the phrenic and azygos veins, and also through similar anastomoses of distal branches of the portal, ultimately affecting the terminals of the internal mammary vein, which penetrate the intercostal spaces and give rise to superficial venules and capillaries. Hepatic sclerosis affects the former route of communication negatively, except that the pre-existing normal flow has established a means of communication so that, although portal obstruction tends to diminish the flow toward the internal mammary via the phrenic veins, it also acts as a dam in both directions, and thus serves to divert the portal blood into the general venous circulation while favoring the distension of the twigs mentioned.

DRESSING FOR CIRCUMCISION WOUNDS.

By Hermann B. Gessner, M. D., of New Orleans.

On infants the dressing consists simply of a copious application of 2 per cent. carbolized vaseline, with a light wrapping of sterile gauze. At every change of the diaper the vaseline and gauze are renewed. On adults a dressing that is just where it is needed and nowhere else, that makes the proper degree of pressure and no more, is applied in the following way. The sutures of catgut when tied are cut long, say three inches long. A strip of gauze, long enough to more than encircle the penis, is rolled into a cord about ½ inch in diameter, and one end is tied between the two strands of any one suture. It is then placed between the two strands of the next suture, which are tied down on it. This is repeated until the end of the gauze roll is brought around to the initial suture, between whose strands it is now again tied. Thus a gauze dressing is applied directly to the circumcision wound, on which it makes more or less pressure according to the traction made on it while tying down the suture strands. It does not interfere with urinating nor does it become saturated with urine. Removal is readily effected, after three days, by cutting the catgut knots that hold the gauze in place and soaking the penis in a basin of warm water. A strip of ZO adhesive makes a satisfactory collar at this stage of the case. This method is not original, being attributed according to oral tradition, to Wyeth of New York.

A CONVENIENT FORM FOR KEEPING BISMUTH-PASTE READY FOR USE.

By M. B. Seelig, M. D., of St. Louis.

The following method of putting up bismuth-paste is convenient, and meets all the rigid requirements of strict asepsis:—Small collapsible tubes, such as vaseline is dispensed in, are procured. These tubes differ from vaseline tubes in that they end in a pointed snout, over which a protective cap screws. The tubes are sterilized by dry heat, and are filled with the paste, after it has been sterilized. The open end of the tube is closed by folding it on itself several times. The paste is used by removing the screw-cap, inserting the nozzle into the fistula, and forcing the paste in by finger-pressure on the tube.

CORRESPONDENCE

PARIS LETTER.

THE SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS.

By Auguste A. Housquains, M. D.

On account of the indecisive and slow methods pursued in the present-day treatment of pulmonary tuberculosis, the advanced minds in the medical profession are attempting to find a more radical and more rapid treatment to combat this disease.

To-day there has been added to the treatment by chemical agents, by serotherapy, by tuberculin-therapy, by vaccine-therapy, the surgical method, which, it may be stated here, is not in opposition to the methods that at present are enjoying considerable popularity. At first it was thought that the surgical treatment would interfere with all other forms of treatment, but this opinion has been dropped. Now though the surgical procedures differed from each other in a decided manner, the investigators who advanced the new treatment always kept before them theories which were in consonance with medical science. If the results of these divers treatments have not always fulfilled the hopes of the investigators, it would nevertheless be wrong to accuse them of experimenting blindly and without the help of ideas of a scientific nature.

In the first place let us mention the mask which Dr. Kuhn, of Berlin, invented and which rests on the principle of Bier's method. This mask allows the inspiration through the nostrils, the nose being slightly compressed, while the expiration is effected freely through the mouth, and in this way a hyperemic stasis of the lungs is brought about. Dr. Willy Meyer, of New York, asserts that by using the Kuhn mask he has produced in patients an increase of white corpuscles, hematin and hemoglobin. In connection with Dr. Meyer's statement it would not be inopportune to remember that in cardiac diseases, in which there is a passive pulmonary stasis, tuberculosis is of the greatest rarity. Again, the positive results of the sclerotic method in external tuberculosis should suggest the idea of using injections of sclerogen in the pulmonary parenchyma. Attempts have been made with these injections, but at the present time this method seems to have been abandoned in the treatment of pulmonary tuberculosis.

Freund's method reposes on an altogether different conception of the disease. This method consists in the rupture of the superior costal cartilage, and is based on the fact that at autopsies of patients, who were cured of a tuberculosis occupying the apex of the lung, an abnormal shortening of the first rib and its cartilage can often be seen, and the result

was a narrowing of the upper part of the thorax, which interfered notably with the expansion of the apex of the lung. This is even the case when the cartilage, instead of being contracted, is ossified. The obliteration of the superior costal cartilage is sometimes so marked that one can see traces of it in the form of a furrow in the pulmonary parenchyma. One can readily see that this interference with the filling of the lungs with air encourages the development of the tubercle bacilli. Hence the idea to practise chondrotomy of the first rib. It goes without saying that the indications for this operation are very restricted, and that the operation ought to be limited to the adult, and that it should be practised only after a diagnosis has been firmly established. As yet the results of this operation have not been published statistically; hence, the value of this procedure cannot be stated.

Another mode of operative treatment in tuberculosis is pneumonectomy, which has for its object the total suppression of the infected foci. In a recent work on the surgical treatment of pulmonary tuberculosis, MM. Tuffier and J. Martin make a plea in favor of this operation. Of course this operation, be it understood, applies only to unilateral tuberculosis, in which the foci are limited. Radiography furnishes the information which is needed before intervention is decided upon. Some typical cases have been published. Tuffier operated on a patient in 1891 who died, seven years after the pneumonectomy, from la grippe complicated by acute miliary tuberculosis.

As regards pneumonotomy, it is not necessary to say much, as the results have not been fortunate. This method has for its object the draining of the cavities of the tuberculous lung so as to disinfect them when the secondary infections cause a hectic fever. Put into practice, this method has proved unsuccessful, and it is highly improbable that it has any followers to-day.

The method which is much more interesting is the one which is called artificial pneumothorax, and which in France has led to a number of interesting investigations. The following will explain how the idea arose. A pulmonary wound constitutes a cavity that has no tendency to retract; not only do the movements of the lung prevent the coming together of the margins, but the constant exercise of a centrifugal force by the empty pleura tends on the contrary to enlarge the wound. Pneumothorax would seem, then, a priori to place a pulmonary cavity in the best condition, so that its walls can come together and cicatrize. It suppresses, in fact, all centrifugal traction and it impedes the movements of the lung. Clinical facts have shown that this action is real. The observations made in a number of cases in which there was a pneumothorax show a retardation in the evolution of pulmonary tuberculosis and a total modification of the symptomatic manifestations, provided the disease does not develop too suddenly.

Forlarini, of Pavia, was the first one to evolve the idea of systematically applying pneumothorax, created surgically, in the treatment of certain forms of pulmonary tuberculosis. The men, who in France have pursued this method, are MM. Dessirier and Dumarest, of Lyons, and P. Claisse, of Paris, the latter being the author of a paper read before the Medical Society of the Hospitals of Paris as well as of a number of articles published in medical journals; and M. Kuss, who is at present employing this method in the Angicourt sanatorium. In the course of a discussion on the scientific and practical treatment of pulmonary tuberculosis, a discussion which was published recently, M. Renon, professor of the Faculty of Paris, contributed an interesting study on the subject.

In principle, pneumothorax ought to lead to total immobilization of the lung, so that upon auscultation the vesicular murmur would no longer be brusque, but, on the contrary, slow and even. The tension should not be variable, a condition which can be achieved by the injection of a gas, generally azote, and which is introduced by means of a special apparatus (Forlarini's or Jeunet's, of Amiens). Certain authorities, such as Tuffier, Murphy, and Branca make an incision into the parietes in the intercostal space. In this way they get to the pleura, which they perforate with a blunt trocar.

The after-care of an operated patient should be closely followed so that the tension of the pneumothorax does not vary, and this is done even for months. Accidents are moreover possible, and it is well not to lose sight of these untoward occurrences.

When adhesions prevented the introduction of azote into the pleural cavity, Tuffier cut out a piece of the parietal layer of the adherent pleura. In this way he produced an extra-pleural pneumothorax in which, at the end of some days, after having sutured and drained the wound, he replaced the air by the introduction of azote.

The results of surgical pneumothorax are surprising. The local and general symptoms improve to such an extent that there is a complete transformation of the patient. As a means of studying the indications and the contraindications, the method should be employed more often, and the favorable manner in which it is regarded to-day gives it a high place in phthisiotherapy.

In those cases in which the adhesions render pneumothorax impossible, even when Tuffier's method is pursued, there has been proposed thoracoplasty, which consists in resecting a number of ribs so as to permit the free movement of the parietes. This method has been proposed by Friedrich, but it has not been favorably received in France. According to Tuffier and Martin the mortality resulting from Friedrich's method is so great that the method should not be encouraged.

Such, then, roughly speaking, is the present status of the question of the surgical treatment of pulmonary tuberculosis. Doubtless, in all the discussions as to the respective merits of the surgical or medical treatment, there is a certain degree of exaggeration. But since the phthisiotherapists limit themselves principally to serotherapy and vaccine-therapy in their treatment of pulmonary tuberculosis, would it not be well for them to add the surgical treatment to the aforementioned methods? While it is true that a number of the surgical procedures, which have been mentioned in this letter, are without practical value, the method of producing artificial pneumothorax should not be criticized in the same way, since the results, in the limited cases in which it has been practised, must be gratifying to all investigators.

July 10th.

DIAGNOSTIC AND THERAPEUTIC NOTES.

An Abdominal Pressure Symptom of Sciatica.—Gara (*Deutsch. med. Wochenschr.*, 1911, No. 16). With the patient lying upon his back, pressure is exerted, by means of a finger, over an area extending from a finger's breadth below the navel to a point, at the same level, two fingers' breadths towards the side of the sciatica. At the other side of the median line, a similar pressure causes no pain. Gara has failed to elicit this sign in only 6 out of 124 cases of sciatica. He considers it a confirmation of his theory that sciatica is a disease, not of the sciatic nerve itself, but of the corresponding nerve-roots and the sciatic plexus. This also explains why constipation aggravates the pain, especially of left-sided sciatica, since here the overloaded rectum presses on the diseased left sciatic plexus; and also why local treatment directed towards the trunk of the sciatic nerve so often fails to accomplish results.

X-Ray Treatment of Malaria.—Skinner and Carson (*Brit. Med. Journ.*, Feb. 25th, 1911). The writers report 11 cases of malaria with marked splenic tumor treated by means of repeated exposures of this organ to *x*-rays. In all the cases, the fever subsided promptly, the spleen became smaller, and the parasites disappeared from the blood. The patients received no quinine. During the period of convalescence the patients did not show the anemia that often follows prolonged quinine medication. In a number of cases, in which quinine had proved ineffectual, the *x*-ray treatment was followed by prompt improvement. At present 5 cases of chronic malaria are under treatment by means of the *x*-ray; it is as yet too early to be certain regarding the outcome. The writers believe that the value of the *x*-rays in malaria depends upon the destruction by this means of the parasites, either directly or by means of some unknown action of the rays upon the blood. Clearly, their observations require confirmation.

Salvarsan Milk.—Jesionek (*Muench. med. Wochenschr.*, 1911, No. 22). Early in the history of salvarsan it was noted that syphilitic infants, if nursed by syphilitic mothers who had received salvarsan treatment, showed a rapid disappearance of all manifestations of the disease. If directly injected with salvarsan, on the other hand, they often died. Ehrlich endeavored to explain this observation by assuming that, in the latter case, the rapid destruction of the parasites caused so great a production of their endotoxines, that the child succumbed. In the former case, however, the antibodies produced, by the treatment, in the mother's blood, passed into her milk and caused a gradual cure of the infant's disease.

Recent observations by Jesionek speak strongly against this hypothesis.

In the first place, chemical analysis of the milk of women recently treated with salvarsan invariably shows the presence of arsenic. It is therefore possible that the good effect of such milk upon the syphilitic infant may be due to the arsenic rather than to the hypothetical antibodies. In the second place, he reports 2 cases in which syphilitic infants nursed by recently injected syphilitic mothers, showed extreme exacerbation of their lesions, justifying the inference that endotoxines from the maternal spirochæta had passed into the milk and so into the child. This method of treating infantile syphilis is therefore not free from danger. These considerations led Jesionek to try upon a suitable case the effect of feeding the child with milk from a goat that had recently been injected with salvarsan. The effect was striking. Within a week the syphilitic lesions had nearly disappeared and twelve days after the beginning of the treatment no trace of the considerable syphilitic ulcerations was visible.

One swallow does not make a summer. Still in view of the facts that the milk of a syphilitic mother injected with salvarsan may be noxious, that the milk of human beings or animals injected with salvarsan contains arsenic in some unknown organic combination, and that such milk has been shown to exert a beneficial effect upon infantile syphilis, the method unquestionably deserves a trial. The technique is so simple as to be at anyone's command. A milch-goat is given 0.6 grm. salvarsan intravenously (a cow correspondingly more), and the milk is fed to the syphilitic child. If further experience demonstrates the value of the method, such milk, fresh or concentrated, will doubtless become an article of commerce.

Serum Diagnosis of Pregnancy.—Mosbacher (*Deutsch. med. Wochenschr.*, 1911, No. 22). There is good ground for the view that many of the accidents of pregnancy are anaphylactic phenomena, due to absorption by the mother of fetal proteid substances. The writer has investigated this problem by means of animal experiment. If a watery suspension of guinea-pig placenta be injected into a non-pregnant guinea-pig, the latter remains unaffected. A second injection, at a proper interval, however, promptly causes the animal's death, showing that it had been sensitized by the first injection. Pregnant guinea-pigs behave quite otherwise. In them a single injection usually proves fatal, always in early pregnancy, less and less so the more advanced the pregnancy. Investigation showed that, from the very beginning of pregnancy, these animals had become sensitized to placental proteid but that, as pregnancy advanced, antibodies were formed which in advanced pregnancy sufficed to protect the animal.

These observations suggest the possibility of a serum diagnosis of pregnancy. By means of the so-called epiphanin reaction it is possible to determine whether a specimen of serum comes from a sensitized human being or animal as the case may be. In brief, the method consists in mixing some of the serum to be examined with an emulsion of the tissue in question (in this case human placenta), and determining the change, if any, in the surface tension. The test can only be carried out by a specially trained man, but that is equally true of the Wassermann reaction. The time may come when the serum diagnosis of pregnancy will be as simple a matter as the serum diagnosis of syphilis. The test will be especially valuable as it will be most strongly marked in the earliest weeks of pregnancy, when all other signs fail us.

BOOK REVIEWS.

BIER'S HYPEREMIC TREATMENT. In Surgery, Medicine, and the Specialties. A Manual of Its Practical Application. By Willy Meyer, M. D., Professor of Surgery at the New York Post-Graduate Medical School and Hospital; Attending Surgeon to the German Hospital; Consulting Surgeon to the New York Skin and Cancer Hospital and to the New York Infirmary, and Prof. Dr. Victor Schmieden, Assistant to Professor Bier, University of Berlin, Germany. Second Revised Edition, Enlarged, Illustrated. Philadelphia and London: W. B. Saunders Company. 1909.

The above authors have translated this classical German work on hyperemic therapy into a very attractive English book. It covers the entire field of medicine and demonstrates the wide range and practical utility of hyperemic therapy. The systematic arrangement, the many illustrations and the exhaustive discussion of the indications and applications of the treatment are presented with surprising clearness. All the different methods of producing hyperemia are considered in detail. It is a book that should appeal to every branch and specialty, and one which can be heartily recommended to the profession.

A HANDBOOK OF PRACTICAL TREATMENT. By many writers. Edited by John H. Musser, M. D., L. L. D., Professor of Clinical Medicine in the University of Pennsylvania, Philadelphia, and A. O. J. Kelly, A. M., M. D., Assistant Professor of Medicine in the University of Pennsylvania, Philadelphia. Volume II. Philadelphia: W. B. Saunders Company. 1911. Price, cloth $6.00; half morocco, $7.50.

This recent work on "Practical Treatment," edited by Kelly and Musser, is written by a number of authorities, particularly fitted to work upon the subject to which they have been assigned in these volumes. The two volumes cover the entire treatment, both medical and surgical, of every disease and its complications. The subject-matter is considered in detail and in a manner that bespeaks its thoroughness. The contributors to this work include over seventy of the most prominent authorities in this and other countries who are masters in this chosen field of work. It is probably the most exhaustive work dealing with practical treatment extant.

HYGIENE AND PUBLIC HEALTH. By Louis C. Parkes, M. D., D. P. H., Univ. of Lond., Consulting Sanitary Adviser to H. M. Office of Works, etc., etc. Fourth Edition with illustrations. Philadelphia: P. Blakiston's Son & Co. 1911. Price, $3.50.

The fourth edition of Dr. Parkes' book has been carefully revised, and the new material which has been added makes it about as good a guide in the matter of hygiene and public health as anyone interested in the subject could possibly wish. The fact that this work has run through four editions indicates that it is being widely read; a deserving tribute, since it has all the qualities which go to the making of a work that is decidedly out of the common. Again, the fact that public hygiene is on the "carpet" at present should widen its circle of readers, especially as the presentation is interesting and to the point.

CASE HISTORIES IN PEDIATRICS. A Collection of Histories of Actual Patients, Selected to Illustrate the Diagnosis, Prognosis and Treatment of the Most Important Diseases of Infancy and Childhood. By John Lovett Morse, A. M., M. D. Assistant Professor of Pediatrics, Harvard Medical School; Associate Visiting Physician at the Infants' Hospital and at the Children's Hospital, Boston. Boston: W. M. Leonard. 1911. Price, $3.00.

This is really a very valuable book. One hundred cases of various types have been selected and considered under the various headings of history, physical examination, diagnosis, prognosis, and treatment. The discussion of the cases is succinct, clear and always to the point. The value of case-teaching is now thoroughly understood, and this practical book of it on pediatrics is a valuable innovation. The book is sure to be widely read, and as widely appreciated.